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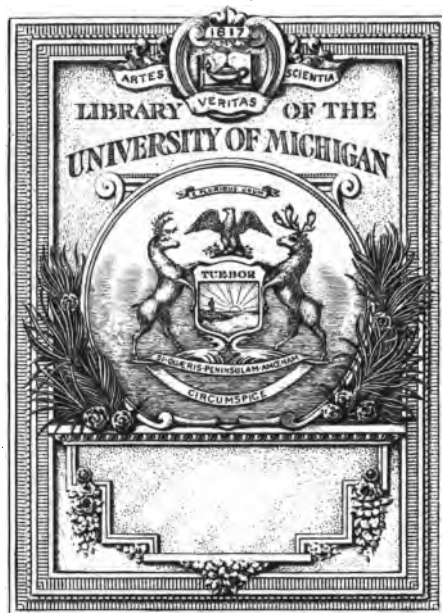
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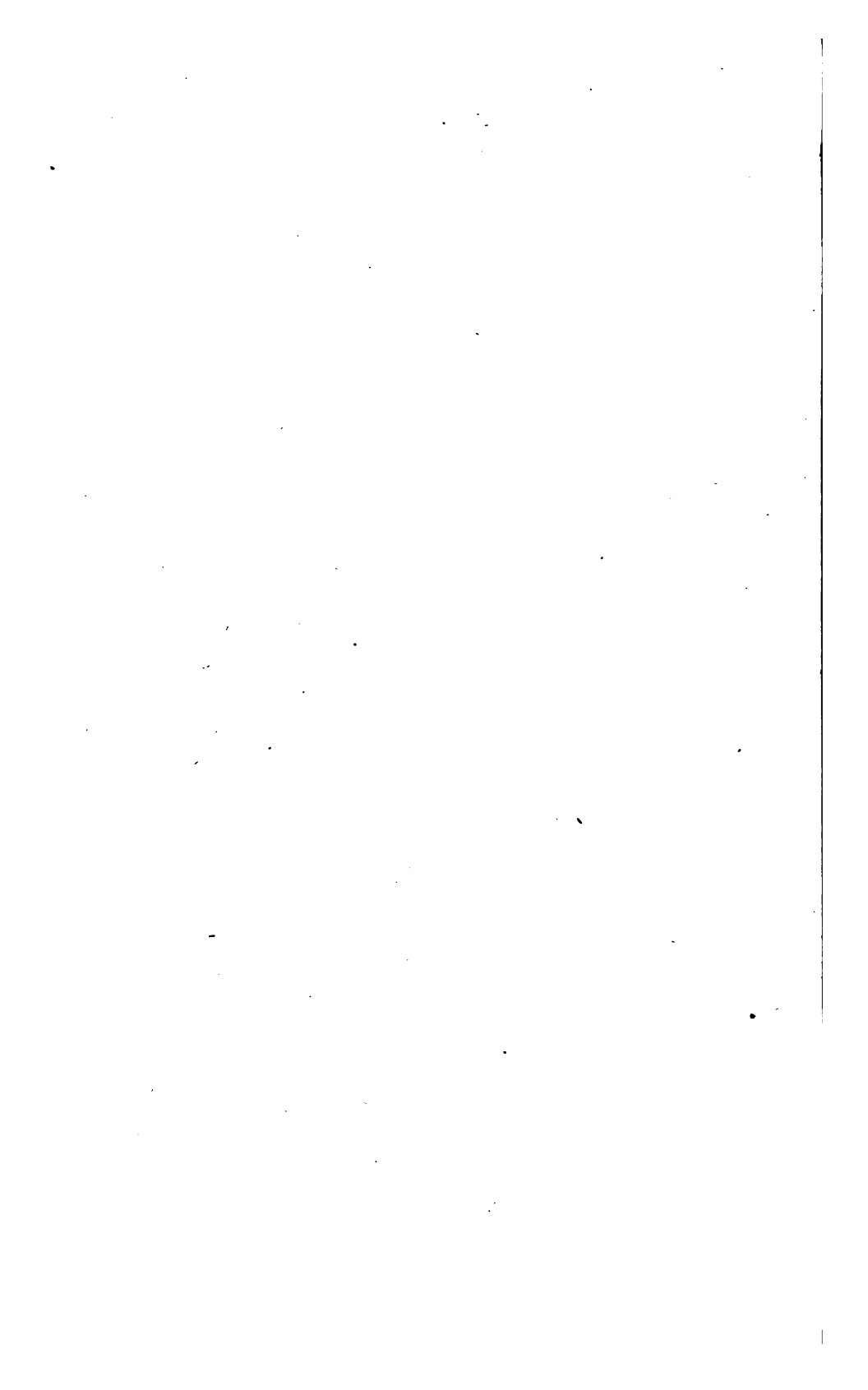
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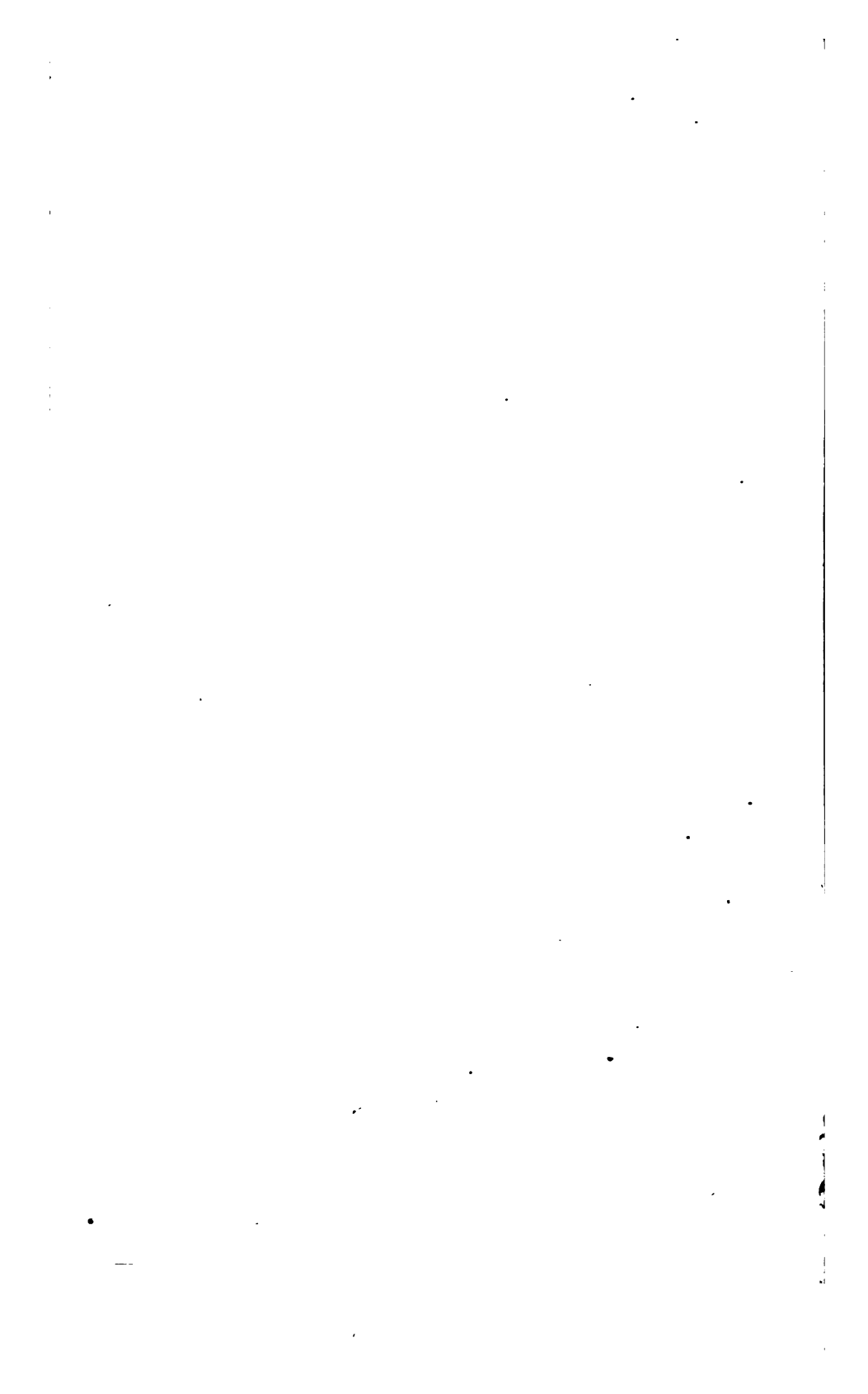


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PRACTICAL OBSERVATIONS
ON THE
BRITISH GRASSES,
ESPECIALLY SUCH AS ARE BEST ADAPTED
TO THE
LAYING DOWN OR IMPROVING
OF
MEADOWS AND PASTURES:
LIKEWISE AN
ENUMERATION OF THE BRITISH GRASSES.

BY WILLIAM CURTIS,

AUTHOR OF THE FLORA LONDINENSIS, BOTANICAL MAGAZINE,
LECTURES ON BOTANY, &c. &c.

"Fiat Experimentum."

FIFTH EDITION.

WITH ADDITIONS

BY JOHN LAWRENCE,

AUTHOR OF THE NEW FARMER'S CALENDAR, &c. &c.

TO WHICH IS SUBJOINED, A SHORT ACCOUNT OF
THE CAUSES OF THE DISEASES IN CORN,
CALLED BY FARMERS
THE BLIGHT, THE MILDEW, AND THE RUST:
BY SIR JOSEPH BANKS, BART.

LONDON:

PRINTED FOR H. D. SYMONDS;
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1812.

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others have attempted to attract him by the offers

“ of. At present, if a farmer wants to lay down his land to
 “ grass, what does he do? He either takes his seeds indis-
 “ criminate from his own foul hay-rick, or sends to his
 “ next neighbour for a supply. By this means (besides a
 “ certain mixture of all sorts of rubbish, which must neces-
 “ sarily happen), if he chances to have a large proportion
 “ of good seeds, it is not unlikely but that what he intends
 “ for dry land may come from moist, where it grew naturally,
 “ and the contrary. This is such a slovenly method of pro-
 “ ceeding, as one would think could not possibly prevail
 “ universally; yet this is the case as to all grasses, except
 “ the Darnel-Grass, and what is known in some few counties
 “ by the name of the Suffolk-Grass (*Poa annua*); and this
 “ latter instance is owing, I believe, more to the soil than
 “ any care of the Husbandman. Now, would the farmer be
 “ at the pains of separating once in his life, half a pint, or a
 “ pint, of the different kinds of grass seeds, and take care to
 “ sow them separately, in a very little time he would have
 “ wherewithal to stock his farm properly, according to the
 “ nature of each soil, and might at the same time spread
 “ these seeds separately over the nation by supplying the
 “ seed-shops. The number of grasses, fit for the farmer, is,
 “ I believe, small; perhaps half a dozen, or half a score,
 “ are all he need to cultivate: and how small the trouble
 “ would be of such a task, and how great the benefit, must
 “ be obvious to every one at first sight. Would not any
 “ one be looked on as wild, who should sow wheat, barley,
 “ oats, rye, peas, beans, vetches, buck-wheat, turnips, and
 “ weeds of all sorts together? Yet how is it much less ab-

of well-directed premiums*: but, hitherto, neither the writings of the one, however convincing,

"surd to do what is equivalent in relation to grasses :—"
 " (STILLINGFLEET's *Misc. Tracts*, edit. 2, p. 365.)

"Meadow and pasture land is oftener neglected than ploughed ground, notwithstanding it generally admits of a much greater proportion of improvement. The best grasses cannot be collected at too great an expence; for, I have seen a small spot of land, in the middle of a large piece, which was laid down twelve or fourteen years since, by Mr. STILLINGFLEET, upon the estate of Mr. PRICE, of Foxley, in Herefordshire, with some choice seeds, at the same time when the remainder of the field was laid down with common seeds; and this spot is considerably better than the rest: it not only appeared so to my judgment, but was allowed to be so by Mr. PRICE's bailiff, who was well acquainted with its produce. From Mr. STILLINGFLEET's experiments, and my own observations, I am clearly of opinion, that any person who has land cultivated for grass, may improve it, by this method of laying it down, to a much greater degree than he can in the common way."—(KENT's *Hints to Gentlemen of Landed Property*.)

See also ANDERSON's *Essays on Agricultural and Rural Affairs*, 2 vols. 8vo. in which this subject, among a variety of others, is very copiously and ably handled; and, on the perusal of which, one cannot but seriously lament, that many of the useful hints of the ingenious author are rendered abortive from his want of botanical information.

* Society for the Encouragement of Manufactures, Arts, and Commerce.

nor the premiums of the other, however alluring, have been productive of the desired effect. Ray-Grass still continues to be the only grass * whose seeds can be purchased for the purpose of laying down meadow and pasture land; and how inadequate that grass is, for such a purpose, is known to every intelligent farmer. Why, indeed, the *Lorium perenne* † should originally have been made use of, in preference to all the other grasses, cannot, perhaps, be satisfactorily accounted for: most probably it owes its introduction to accident, or to its being a common grass whose seeds were easily collected, rather than to its being preferred from any investigation of its merits compared with the others; however this may be, there appears to be no reason for excluding the others—for it would appear exceedingly improbable, that, of upwards of a hundred grasses ‡ growing wild in this country, the Author of nature should have created one only as suitable to be cultivated for pasturage or fodder.

* We have indeed been informed that the seeds of the *Holcus Lanatus*, or *Meadow Soft-Grass*, gathered in great quantities in some parts of Yorkshire, is sold in several of the London shops under the name of Yorkshire Grass.

† Ray or Rye-Grass.

‡ The word grasses is here understood in its strict sense.

Taking it for granted then, that there are other grasses, superior in many respects to the Ray-Grass, this question naturally arises—How comes it that they have not found their way into general use? To this it may be answered, improvements in any science, but more especially in agriculture, are slow in their advances; and, perhaps, no class of men adheres more pertinaciously to old prejudices than the farmer.

The difficulty of distinguishing the grasses from each other, has, no doubt, proved one grand obstacle; many of these plants are so much alike, that the most discerning botanist is often at a loss to know some of them a part; if so, how easily may the husbandman be deterred from the arduous task.

There is another cause which may have operated against their introduction: grasses, as well as other plants, have been frequently recommended from a partial and limited observation of them, by persons who neither knew them well as botanists or agriculturists, or who have recommended them, merely to gain by the credulity of the public.

But, perhaps, the chief reason has been, that persons who might be expected to make the improvements, have not had the means fairly

put into their hands to make the experiment. Whether the method we have adopted on this occasion, may be more successful than those of our predecessors, must be determined by the event. From the numerous applications made to me, by a variety of gentlemen, for grass seeds, it has appeared incumbent on me to do something which might gratify them, and render the public an essential service ; I wish, at least, to put it in their power to decide on a matter which has been long agitated, and from which I am far from being the only one that entertains the most sanguine hopes of its proving a great national advantage.

The grasses recommended will, I am confident, do all that our natural grasses can do: they are six of those which constitute the bulk of our best pastures ; most of them are early, all of them are productive, and they are adapted to such soils and situations, as are proper for meadows and pastures.

But let no one expect them to perform wonders ; for, after all, they are but grasses, and, as such, are liable to produce great or small crops, according to particular seasons, or to the fertility or barrenness of the soil on which they are sown.

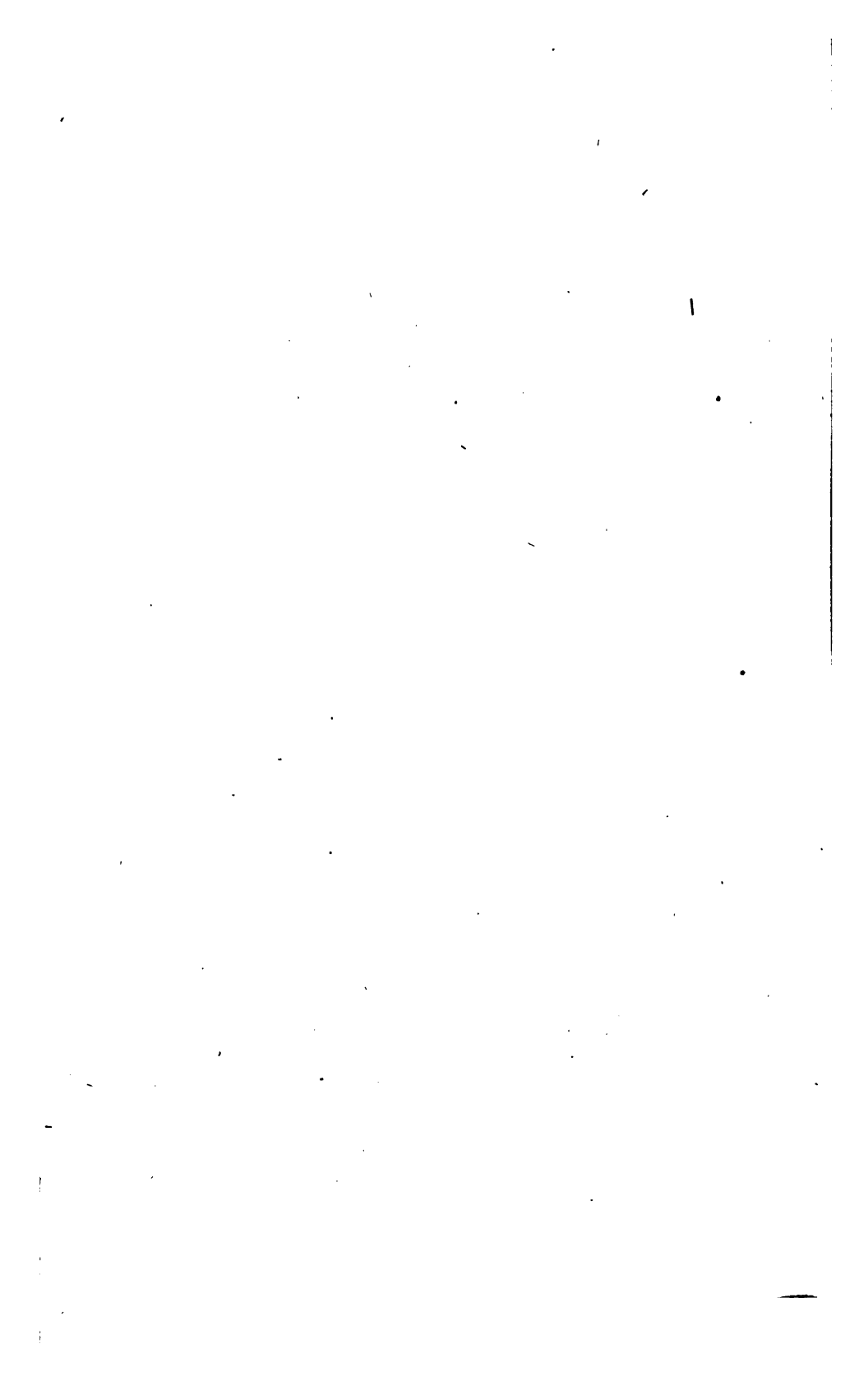
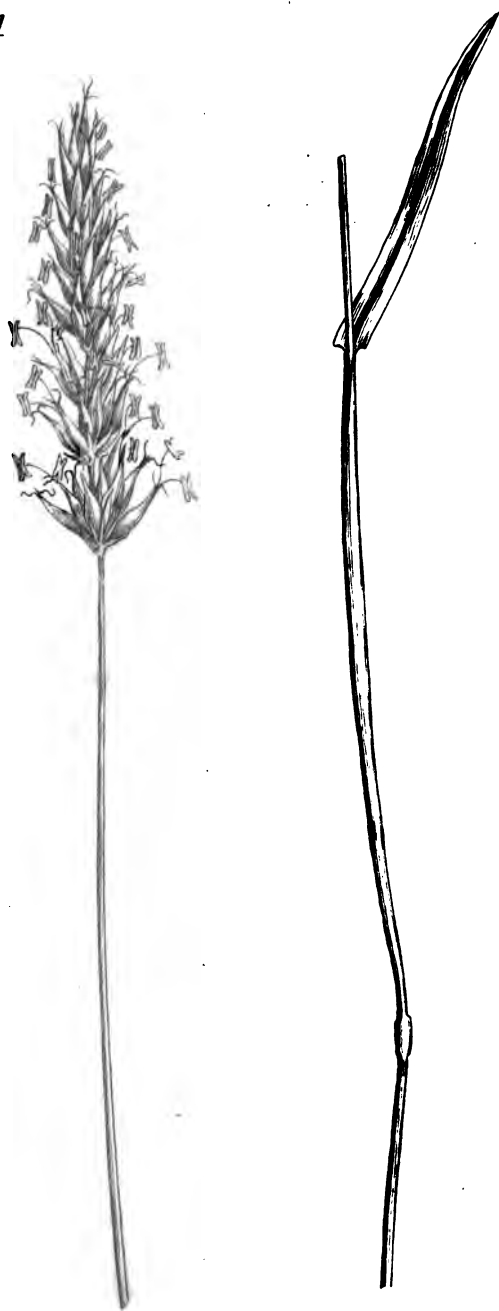


Plate 1



Pub. by S. Curtis, Florist Waltham May 31. 1804.

OBSERVATIONS

ON THE GRASSES RECOMMENDED.

I. ANTHOXANTHUM ODORATUM.

Sweet-scented Vernal Grass.—Tab. 1.

Next to the *Cynosurus cæruleus*, or *blue Dog's-Tail Grass*, this, of all our English grasses, comes first into blossom; it is therefore valuable as an early grass; it is valuable also for its readiness to grow in all kinds of soil and situation, being found in bogs, in woods (especially such as are of low growth, or have had the under-wood cut down), in rich meadows, and in dry pastures; in point of crop it is not so productive as some, yet more so than others; cattle are fond of it, and it is well known to be the only English grass which is odoriferous; the agreeable scent of new made hay arises entirely from this grass, hence its name of *odoratum*, or *sweet-scented*;

the green leaves, when bruised, readily impart this perfume to the fingers, by which means the foliage may at all times be known ; and persons not deeply skilled in botany, may distinguish it when in blossom, by its having only two threads or stamina to each flower.

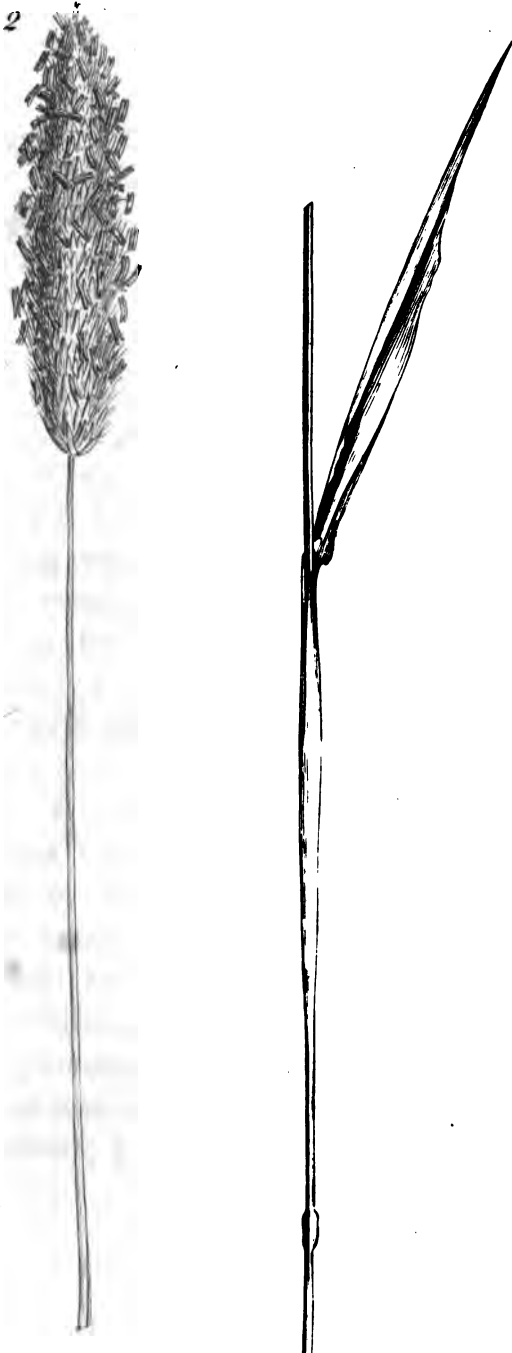
Of the several grasses, here recommended, it is the least productive in point of seed. In certain situations, and more especially in dry seasons, the leaves of this grass are apt to be blighted, from a disease which changes them to an orange hue, and which has proved highly injurious to the plants which we have cultivated.

II. ALOPECURUS PRATENSIS.

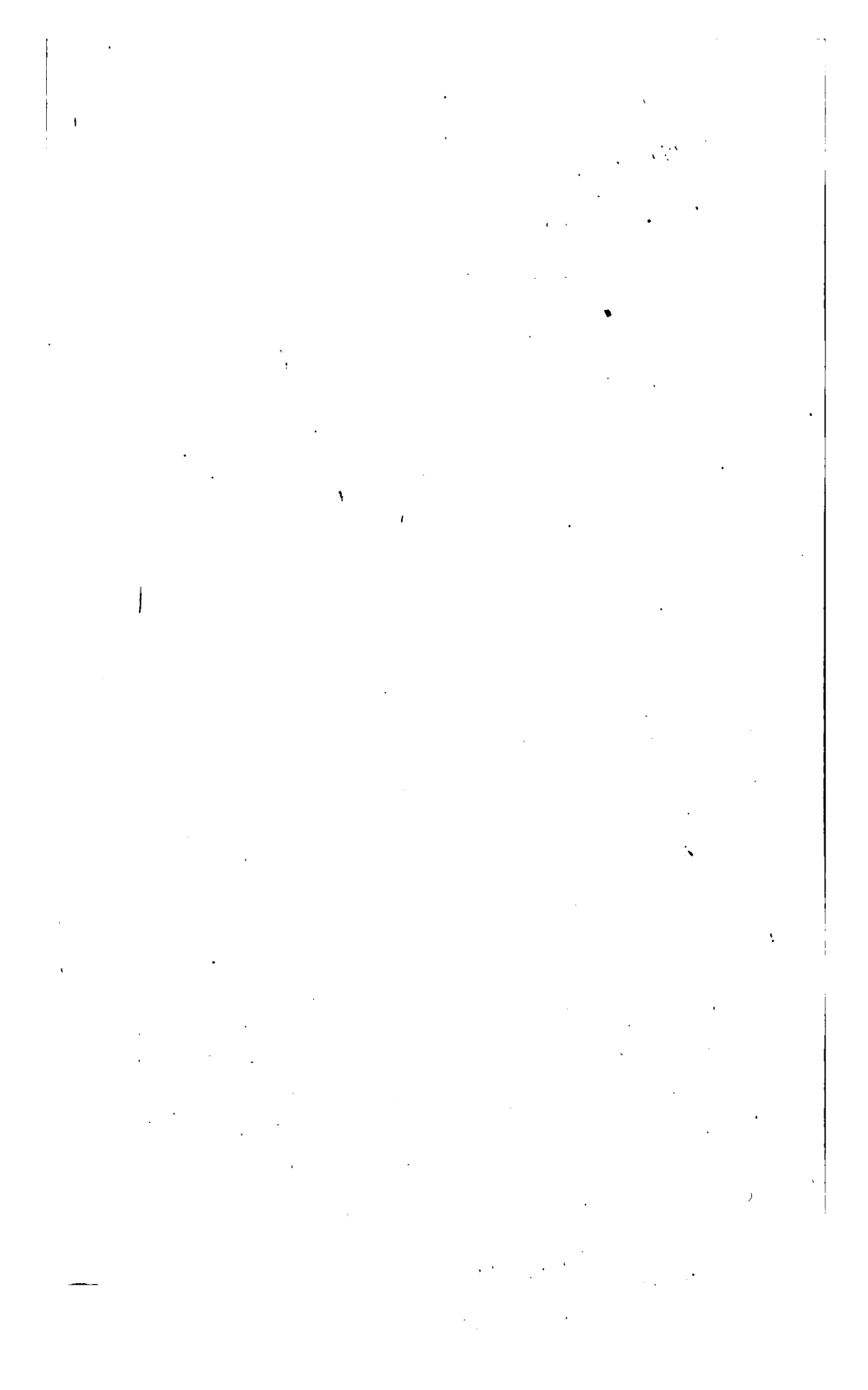
Meadow Fox-Tail Grass.—*Tab. 2.*

Produces its spike almost, and in some situations to the full, as early as the *Anthoxanthum* ; hence it is equally valuable as an early grass ; and, as it is much larger, and quicker in its growth, it is consequently much more productive. It shoots very rapidly after mowing, producing a very plentiful aftermath ; and, where the land is rich, and two crops are not thought too much for it to bear, of all our English grasses this ap-

Plate 2



Pub by T. Curtis, Florist Watworth May 31. 1804.



pears to be best adapted for such a purpose, and ought to form a principle part of the crop: its foliage may appear coarse to some, but it should be remembered, that no grass can be productive that is not in some degree coarse; if mown early, just as it comes into bloom, though the leaves are large, the hay will not be coarse; in general, the great advantage arising from the earliness of this and the preceding grass, is entirely lost at a distance from London, where hay-making commences late, and where the husbandman seems to wait for a crop of general indiscriminate herbage, rather than of grass.

The *Meadow Fox-Tail* is more confined as to its place of growth, growing naturally in a moist soil only; hence it is best adapted to improve very wet ground that may be drained of its superfluous moisture, or to form or meliorate meadows that have a moist bottom, and are not apt to be burnt up in dry summers.

Its seeds are easily collected; but a great number of them, in certain seasons, are destroyed by a very minute orange-coloured larva or maggot, which feeds on the embryo of the seed, and most probably produces some small species of *Musca*.

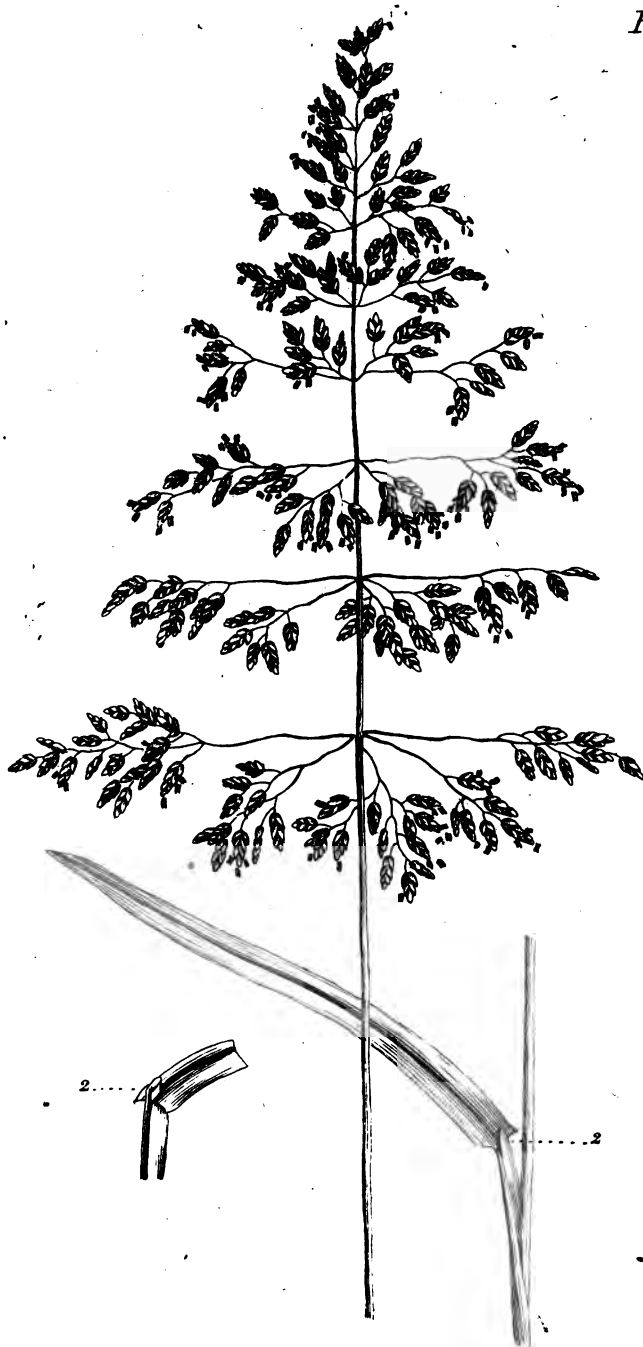
This grass is distinguished in some degree, by the largeness of its foliage, and by its producing a soft spike on a long stalk early in May. The *Meadow Cat's-Tail Grass*, or *Timothy Grass*, produces a spike somewhat similar, but rougher to the touch, and much later in the summer.

III. POA PRATENSIS.

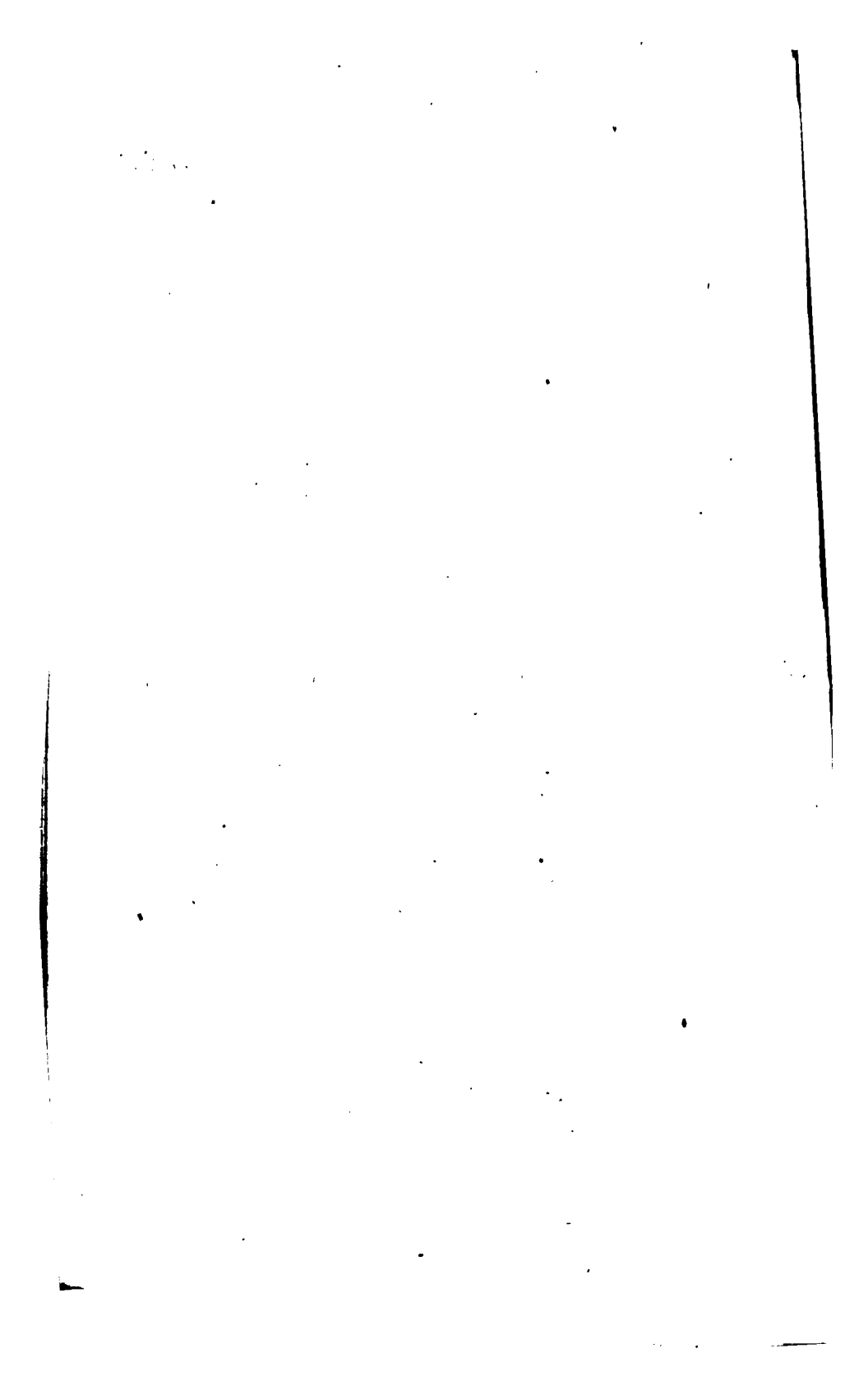
Smooth-Stalked Meadow Grass.—Tab. 3.

The foliage of this grass begins to shoot, and to assume a beautiful verdure very early in the spring, but its flowering stems are not produced so soon, by a week at least, as those of the *Alopecurus*; this trifling difference, however, in point of earliness of flowering, does not prevent it from ranking, very properly, with the two preceding; and, where early grassy pasturage is a desideratum, we are of opinion it cannot better be obtained than by a combination of these three; if crop be at the same time an object, the *Meadow Fox-Tail Grass* should predominate.

This grass rather affects a dry than a moist situation, and hence it keeps its verdure in long-



Pub. by S. Curtis, Florist, Walworth May 1804.



continued dry weather, better than most others, but it will thrive in either; will grow on the top of a dry wall, but much more luxuriantly in a rich meadow; it is to be observed, however, that it has a root which creeps, like the *Couch-Grass* (*Triticum-Repens*), and is almost as difficult to extirpate; it ought, therefore, to be cautiously introduced, where the pasturage is not intended to be permanent.

Of the trifling improvements which we flatter ourselves to have occasionally made, in some of the specific characters of the English plants, none have given us more satisfaction than those which relate to this species and the *Poa trivialis*, two grasses so very similar, as scarcely to be distinguished, even by the most discerning eye, at a little distance, and very obscurely characterised by LINNÆUS; but which, by attending to two characters only in each grass, may now, in a moment, be distinguished with the utmost facility and certainty.

The *Poa pratensis* has a smooth stalk, the *trivialis* a rough one, perceptible when drawn betwixt the thumb and finger, and which arises from little sharp points, visible when the sheath of the leaf, which covers the stalk, is magnified, *vide Tab. 4, fig. 1*; the *trivialis* has along pointed mem-

brane, at the base of the leaf, *fig. 2.*; the *pratensis* a short blunt one, *Tab. 3, fig. 2.* These grasses differ specifically in a variety of other particulars, not necessary here to dwell on, and for which such as wish to be more particularly informed of, may consult the *Flora Londinensis*. We shall just mention one striking character of this grass; it never throws up any flowering stems or bents, but once in a season (May), while many other grasses, especially the *Ray-Grass* and *Dwarf-Meadow*, are putting them forth perpetually; from this peculiarity, joined to its hardness and verdure, it would appear to be a good grass for lawns or grass plats.

In dry soils, we have found the crop, from this grass, yearly to diminish in quantity, and to be at last very trifling, when its roots have matted together and exhausted the ground, which they seem very apt to do; in moist meadows this effect has not been so observable: upon the whole, this grass has rather sunk than risen in our estimation.





VL. POA TRIVIALIS.

Rough-Stalked Meadow Grass.—Tab. 4.

Similar as this grass and the preceding are, in appearance, particularly in their mode of flowering, they differ very essentially in their qualities. While the *Smooth-Stalked Meadow Grass* is found chiefly in dry pastures, the *Rough-Stalked* principally occurs in moist meadows, or on the edges of wet ditches ; it loves moisture, and a situation that is sheltered ; hence, though there are few grasses more productive, or better adapted for hay or pasturage, it is a tender grass, and liable to be injured by severe cold, or excessive drought : in very wet ground, near the Thames, we have observed it grow very tall, while in poor land we have, on the contrary, seen it altogether as diminutive ; it is, perhaps, no small recommendation to it, that it is a principal grass in that uncommonly productive meadow, near Salisbury, mentioned by STILLINGFLEET, and more particularly described in the Memoirs of the Bath Agricultural Society, vol. 1. p. 94. Vide *Append.*

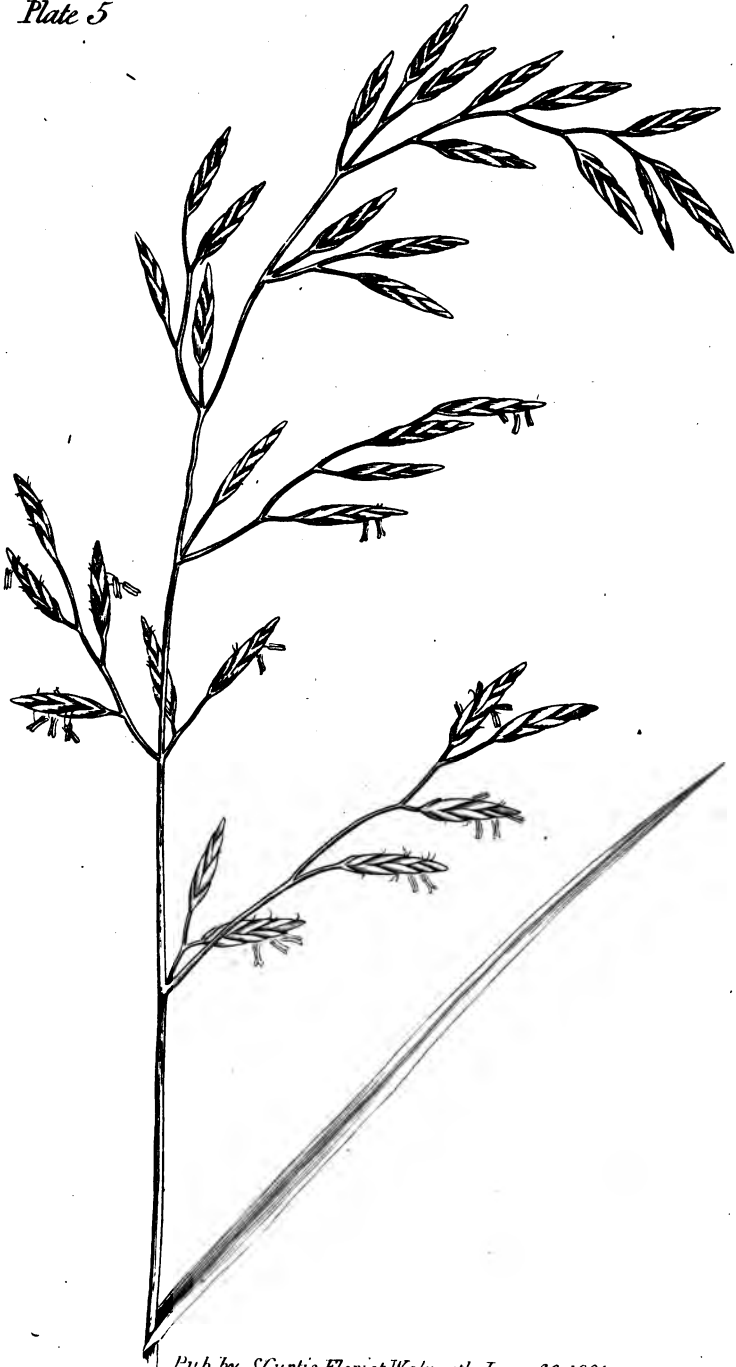
We may remark, that the seeds of the *Poa trivialis*, and *Poa pratensis*, but more especially those of the former, are apt to be entangled, and adhere to each other, as if cobwebs, had been intermixed with them, which makes it difficult to disperse them evenly in sowing.

V. FESTUCA PRATENSIS.

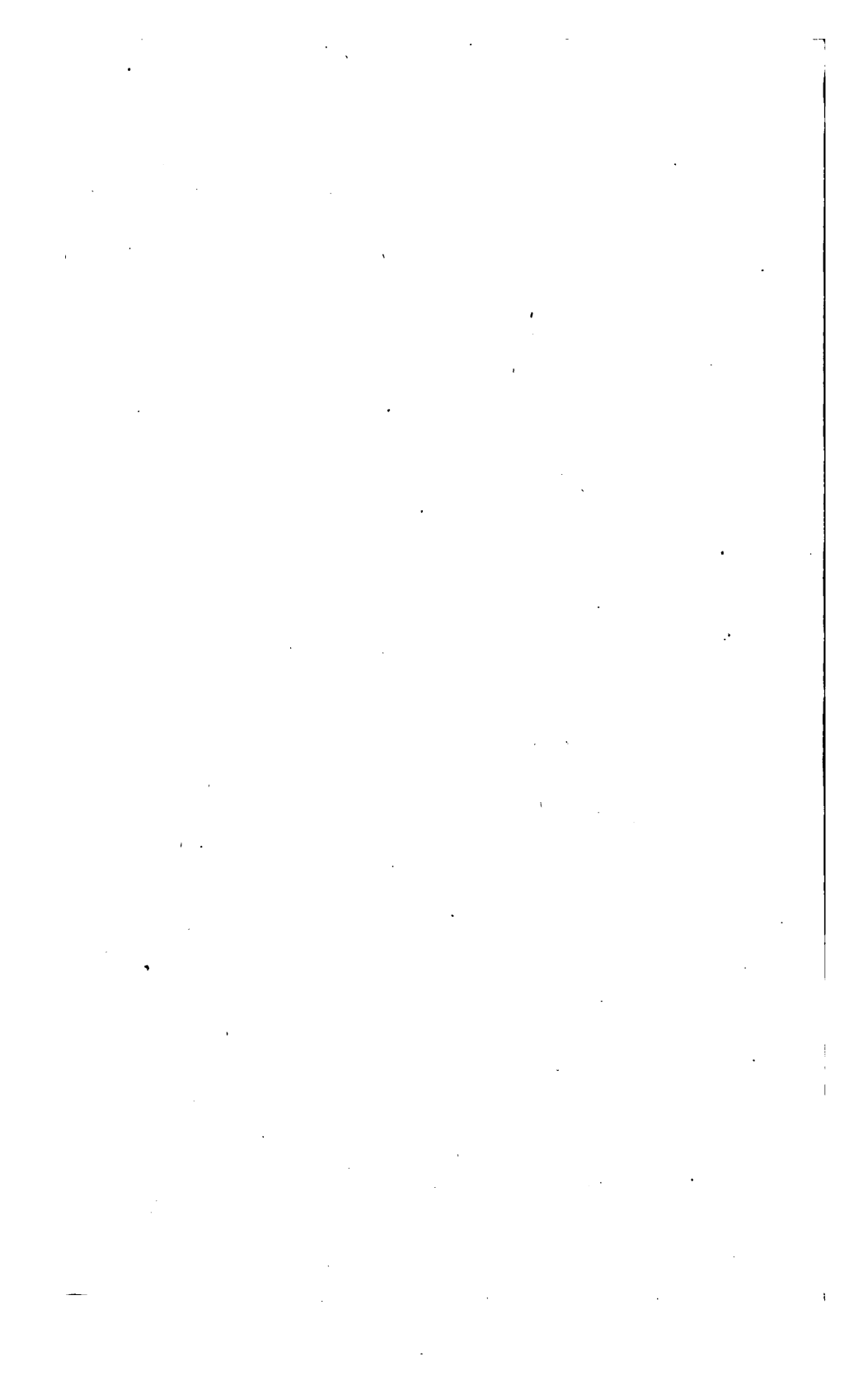
Meadow Fescue-Grass.—Tab. 5.

Of the several grasses here recommended, this comes the nearest, in its appearance, to the Ray-Grass, to which, however, it seems to us to be, in many respects, greatly superior, at least for the purpose of forming or improving meadows; it is larger, and more productive of foliage; it is strictly perennial, is very hardy, and will thrive, not only in very wet, but also in dry ground; we have found it growing in all situations, from the sand-pits at Charlton, to the osier-grounds at Battersea; and it abounds in the very best meadows about London; in short, we know of no grass more likely to supply the deficiencies complained of in Ray-Grass; and yet it has not, that we know of, been particularly recommended. One quality it has, which bids fair to introduce

Plate 5



Pub. by S. Curtis Florist Walworth, June 30. 1804.



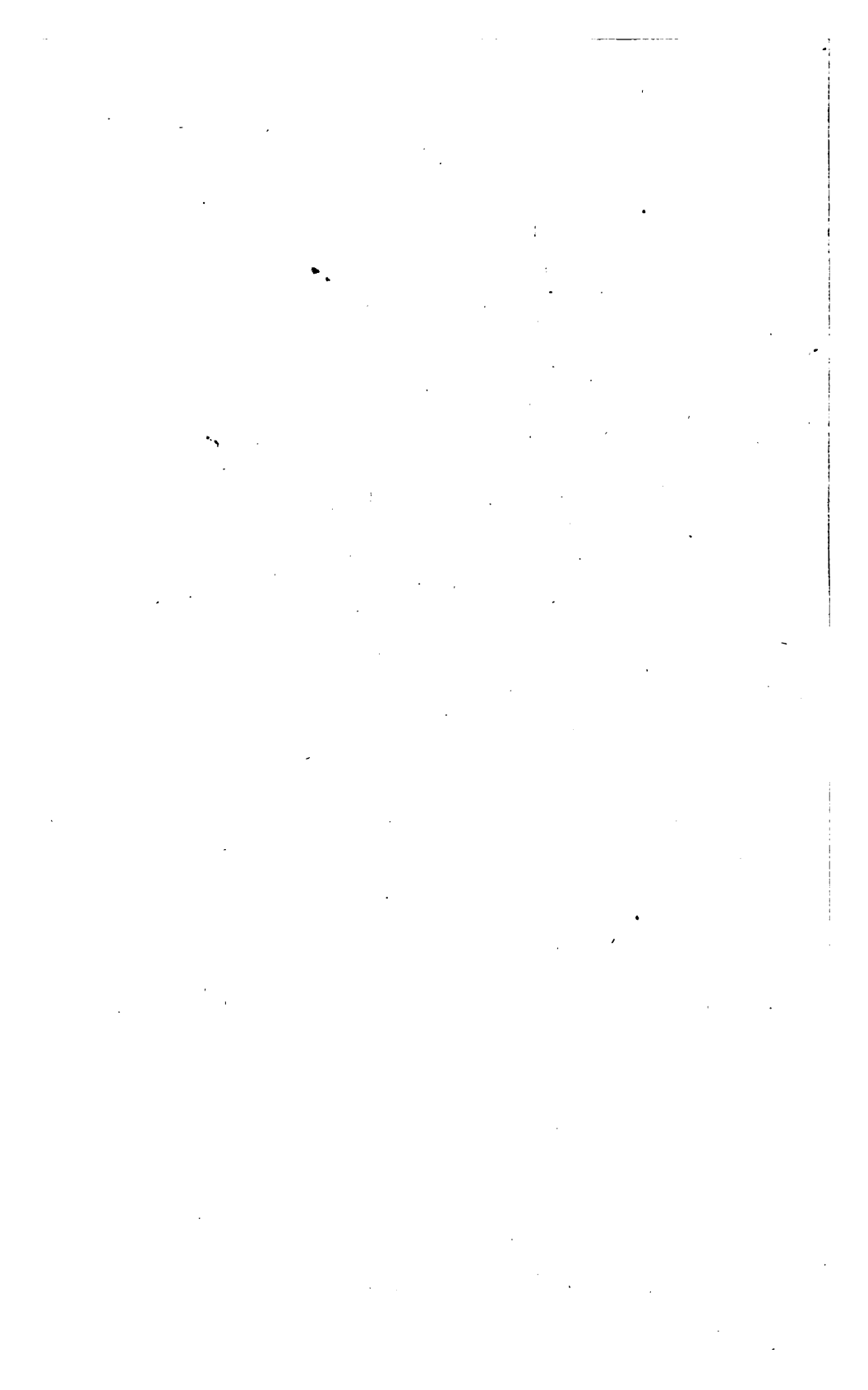


Plate 6.



Pub. by S. Curtis Florist Walworth June 30. 1874

it quickly into more general use; it produces more seeds than any of the others, which are easily gathered, and readily grow. In one respect it is inferior to the three first grasses—it does not produce its flowering stems earlier than about the middle of June, a fortnight or three weeks later than the *Meadow Fox-Tail Grass*; yet it cannot be considered as a late grass, as most of the *Agrostis* tribe, and the *Meadow Cat's-Tail Grass* (*Phleum pratense*), flower at least three weeks later. It must be carefully distinguished from the *Festuca elatior*, or *Tall Fescue-Grass*, which is very similar, but much coarser.

VI. CYNOSURUS CRISTATUS.

Crested Dog's-Tail Grass.—Tab. 6.

It is chiefly from the great character which this grass bears, as a favourite and wholesome food for sheep, and from its being found in our soundest and best pastures, that it is here recommended. It grows naturally in dry situations, and will not thrive in meadows that are very wet. It flowers about the same time as the *Meadow Fescue-Grass*, and is not very productive of foliage: as its flowering stems and heads

are always left untouched by cattle, its seeds may easily be collected where the pasturage is fed.

Additional Remark.—Finding that this grass produces but little foliage, that its stems are wiry, and constantly refused by cattle; that, from its roots being fibrous, and penetrating to no great depth, it becomes, in dry summers, little better than an annual; we are induced to think less favourably of its intrinsic merit, and to consider it as greatly inferior to the other five.

OF THE ABOVE SIX GRASSES IT WILL APPEAR,
THAT THE

Meadow Fox-Tail, and *Rough-Stalked Meadow Grass*, are for fittest for moist land.

Meadow Fescue, or *Sweet Scented Vernal*, is fittest for land either moist, or moderately dry.

Smooth-Stalked Meadow Grass, and *Crested Dog's-Tail*, are fitted for dry pasture.

In the more southern parts of this kingdom we may in vain expect to clothe dry soils with the constant verdure of grasses; they will not stand the drought of hot parching summers: in

such seasons, it is only plants which send down roots to a greater depth than can be expected to look green or be productive, as *Lotus corniculatus*, *Medicago falcata*, &c.

THE ORDER OF THEIR FLOWERING.

1. Sweet-Scented Vernal.
2. Meadow Fox-Tail.
3. Smooth-Stalked Meadow.
4. Rough-Stalked Meadow.
5. Meadow Fescue.
6. Crested Dog's-Tail.

We could easily add many more grasses to this list, and those too which, perhaps, might be highly deserving of it; but we have our doubts whether; by recommending more, we might not increase the difficulty of introducing grass seeds, without any adequate advantage.

We shall, however, just take the liberty of making a few practical remarks on such others of the English grasses, as, from twenty years culture and observation, appear to us deserving particular notice.

AGROSTIS CAPILLARIS.

Fine Bent-Grass.

A very common grass on all dry heaths, in pastures, and by road sides, distinguished by its very finely divaricated panicle. A principal, and to us an insuperable objection to this tribe of plants, is the lateness of their flowering, scarcely any of them coming into bloom till July; if any of them deserve culture, it is this species, as it is one of the earliest, and has fine and productive foliage.

This is the grass which, in many parts of the kingdom, forms the turf of our extensive pastures, downs, and sheep-walks; we have frequently observed whole acres covered nearly with it alone: for grass-plats and lawns, it seems likely to be the best of all our English species, being of ready growth, bearing the scythe well, producing fine foliage, and resisting drought better than most; the foliage of *Agrostis fascicularis* is still finer, and would probably succeed better, for the same purposes, in moist soils.

AGROSTIS PALUSTRIS.

Marsh Bent-Grass.

As the *Agrostis capillaris* is very common in dry pastures, this abounds in wet meadows and marshes, where it frequently grows to a great height; its foliage, like that of the other, is fine, but it is liable to the same objection of lateness of flowering.

AIRA AQUATICA.

Water Hair-Grass,

Is, in point of sweetness, superior to all our other British grasses, and equal to any foreign one we are acquainted with, but not cultivatable, as it is entirely an aquatic.

ALOPECURUS GENICULATUS.

Flote Fox-Tail Grass.

Like the *Festuca fluitans*, agreeable to cattle, and productive, but affects situations too wet, in our opinion, for meadows.

AVENA ELATIOR.

Tall Oat-Grass,

Is more frequently found on the confines of meadows, in hedge-rows, and hedges, than in meadows themselves, in which, however, it is sometimes found abundantly; it is early, very productive, and produces a very plentiful aftermath; in excellence it comes near to the *Alopecurus pratensis*, for which it may prove no bad substitute. Is cultivated abroad, *vid. Annals of Agricul. v. xii. p. 441*. There is a variety of it with knobby roots, a troublesome weed in corn-fields in some parts of the kingdom.

AVENA FLAVESCENS.

Yellow Oat-Grass,

Affects dry soils, is rather early, and tolerably productive; bids fair to make good sheep pasture.

AVENA PUBESCENS.

Rough Oat-Grass,

Is tolerably early, hardy, productive, and of good verdure, but its foliage is uncommonly bitter.

BRIZA MEDIA.*Common Quaking-Grass,*

Affects chalky soils, but is not confined to them; is moderately productive, and likely to form good sheep pasture.

BROMUS MOLLIS.*Soft Brome-Grass.*

What shall we say of this grass? concerning which such various opinions are entertained; a grass which predominates in most of our meadows about London, in the spring, and which, if it were cut on its first coming into ear, would form the principal crop, and might, probably, make no bad hay; but, as, at this period, the general herbage is not considered as sufficiently forward, it is suffered to ripen, and shed its seeds before the meadow or pasture is mown, and thus is lost, or becomes of little value; in such meadows and pastures it is yearly renewed by its seed, for it is an undoubted annual. As an early grass, it might probably be cultivated to advantage, in the manner of rye; at present we can-

not but consider it as a weed, usurping the place, and hindering the growth, of better herbage.

BROMUS ERECTUS.

Upright Brome-Grass,

Grows wild in chalky pastures, to which, as far as we have observed, it is altogether confined, and constitutes a considerable part of the grassy herbage; we have been induced to think less favourably of it, from seeing it grow wild, than when cultivated in a garden; it is, however, deserving of trial, especially as it is early.

CYNOSURUS CŒRULEUS.

Blue Dog's-Tail Grass.

Earliest of all the British grasses, flowering a fortnight sooner than the *Sweet-Scented Vernal*, grows naturally on the tops of the highest limestone rocks in the northern parts of Great Britain; not very productive, yet may, perhaps, answer in certain situations, especially as a grass for sheep; bears the drought of summer remarkably well.

DACTYLIS GLOMERATUS.

Rough Cock's-Foot Grass.

A rough coarse grass but extremely hardy and productive, common in orchards and meadows, and rather early.

FESTUCA OVINA.

Sheep's Fescue-Grass.

From observations made on this grass, where it has grown wild, and from cultivating it in a moist soil, the reverse of its natural one we are induced to think differently of it from most writers.

LINNÆUS, if we are not mistaken, was the first who considered it in a favourable point of view: in his *Flora Suecica*, he thus speaks of it: "This grass is a principal food of sheep, who have no relish for such hills and heaths as are without it;" hence he calls it *ovina*. GMELIN *Fl. Sibir.* says, "That the Tartars choose to fix during the summer in those places where there is the greatest plenty of this grass, because it

" affords a most wholesome nourishment to all kinds of cattle, but chiefly to sheep."

It is possible, that, in the more elevated parts of northern Europe, this grass may differ somewhat in its appearance and produce, from what it does with us; in the environs of London it grows spontaneously, on dry elevated heaths and commons; in such situations its produce is extremely trifling, its foliage hard and wiry, and its appearance, in dry summers, unpleasantly brown. In a rich moist soil the foliage retains its verdure, and becomes much longer, but still, being in its nature a small plant, it cannot be productive—consequently has no pretensions to be considered as fit for a hay grass; it is, in fact, to the *Alopecurus pratensis*, what the *Daisy* is to the *Cichorium Intybus*. In the cultivation of plants, it is well to bear the old maxim in mind, *Nature will prevail*. If we force a plant on a soil or situation foreign to that in which it is constantly found, we deceive ourselves; were the *Festuca ovina* to be sown in a rich moist soil, the grasses, and other plants, natural to such a soil and situation, would quickly overpower it, and, in the space of a year or two, scarcely a blade of it would be discernible; or were we, for the sake of our sheep (taking it for granted that they are

uncommonly attached to it, the reverse of which we have heard asserted by men of observation), to plough up our elevated heaths and downs, and sow them with this grass, the sheep would starve on them in dry summers. Where then is the boasted value of this grass? Mr. ANDERSON, it is true, has bestowed ten pages on its merits; but he surely errs (*humanum est errare*), when, after describing its leaves as little bigger than horse hairs, or swine's bristles, and seldom exceeding six or seven inches in length, he says, "That it is capable of affording an immense quantity of hay, promises to be one of the most valuable grasses our country produces, and to make a most valuable acquisition to the farmer."

It appears to us applicable only to the purpose of making a fine-leaved grass-plat, that shall require little or no mowing. For this purpose it must be sown about the middle of August, in an open, not too dry, situation, broadcast, and that thickly, on ground very nicely prepared and levelled; when it has once got possession of the soil, it will form so thick a turf, as to suffer few intruding weeds, and may be kept in order with little trouble.

FESTUCA DURIUSCULA.

Hard Fescue Grass.

Affects such situations as the *Smooth-Stalked Meadow-Grass*, and *Sheep's Fescue*, all three being not unfrequently found on walls ; it is common also on our downs, and in our meadows and pastures ; according to situation, it varies much in size and breadth of leaf, as well as colour of its panicle, but in all situations is very distinct from the *ovina*.

It is early and productive, its foliage is fine, and of a beautiful green ; hence we have thought it was of all grasses the fittest for a grass-plat, or bowling-green ; but we have found, that though it thrives very much, when first sown or planted, it is apt to become thin, and almost disappear, after a while ; from its natural place of growth, it appears to be a proper grass to unite with those intended for sheep pasture.

FESTUCA ELATIOR.

Tall Fescue-Grass.

- Very similar to the *Festuca pratensis*, yet specifically different ; found naturally in marshes, in

which it grows to a great height; is hardy, and very productive, but, we apprehend, too harsh and coarse for hay, yet may, perhaps, be a good grass for soils, which cannot be drained of their too great moisture, are over-run with *Meadow-Sweet*, and such like weeds, or which are apt to be overflowed.

The seeds of this plant, when cultivated, are not fertile, hence it can only be introduced by parting its roots, and planting them out; in this there would be no great difficulty, provided it were likely to answer the expence, which we are strongly of opinion it would, in certain cases; indeed we have often thought that meadows would be best formed by planting out the roots of grasses, and other plants, in a regular manner; and, however singular such a practice may appear at present, it will probably be adopted at some future period: this great advantage would attend it, noxious weeds might be more easily kept down: until the grasses, and other plants, had established themselves.

FESTUCA LOLIACEA.

Darnel Fescue-Grass.

Found sparingly in good meadows near London, extremely similar to *Lolium perenne* in appearance, but taller and more productive; its foliage is harsh, and, like the *Lolium perenne*, it runs too much to stalk; it is undoubtedly a distinct species, very hardy, tolerably early, of very rapid increase, yet not by creeping roots; more deserving of trial than many which have been pompously recommended.

The seeds of this grass being in the same predicament as those of *Festuca elatior*, the plant can only be propagated in the same way.—A more particular account of *Festuca loliacea*, *elatior*, and *pratensis*, may be seen in the *Flor. Lond. fasc. 6.*

FESTUCA CAMBRICA.

Welch Fescue-Grass.

Somewhat like the *Festuca duriuscula* in appearance and qualities. I never could obtain any perfect seed from it at my gardens, Lambeth-Marsh, or Brompton.

FESTUCA FLUITANS.

*Flote Fescue-Grass.**Vid. ALOPECURUS GENICULATUS.*

HORDEUM MURINUM.

Wall Barley-Grass. Squirrel-Tail Grass.

Common at the foot of walls, and by the sides of paths, seldom seen in meadows and pastures; yet, in some parts of the kingdom, is found amongst the hay, in sufficient quantity to prove highly injurious to horses—the awns, or beards of their ears, sticking into their mouths, and making them so sore that they are unable to eat—ought therefore to be known, that it may be avoided.

Our information respecting the *Squirrel-Tail Grass*, though from highly respectable authority, we have some reason to think may be incorrect as to the species;—shall leave it to some botanist, who may visit the Isle of Thanet*, to

* Where the evil occasioned by this grass is of so serious a nature, that we have known gentlemen, going to reside there for a short time, have their hay sent them from London.

determine, whether it be the *Hordeum murinum*, *pratense*, or *Maritimum*.

HORDEUM PRATENSE.

Meadow Barley-Grass.

A taller and more delicate grass than the preceding, found generally in good meadows, and sometimes forming a great part of the crop; yet, as it is neither so early, nor so productive, as many others, and may possibly have the same bad quality as the foregoing, must be cautiously introduced.

HOLCUS LANATUS.

Meadow Soft-Grass.

A very common grass in all meadows and pastures; also in waste grounds, and woods newly cut down; is hardy and productive of foliage, flowers a month later than the *Anthoxanthum*; when its red panicle appears, the farmers consider their grass fit for mowing. Its foliage is soft and woolly; if not disliked by cattle, on that account, may rank with some of the best grasses; if more early, would be more valuable.

HOLCUS MOLLIS.

Creeping Soft-Grass.

We are induced to think better of this grass, than when we figured and described it in the 54th No. of the *Flora Londinensis*, having found that it will grow well in a sandy soil, and bear the drought of summer better than most others. Capt. DORSET is of opinion, that it may be even cultivated advantageously in barren sandy soils.

LOLIUM PERENNE.

Ray or Rye-Grass.

Though the *Lolium perenne* may not possess all that is desirable in a grass, it is not therefore to be considered as of no value, and indiscriminately rejected. The complaint so generally urged against it, of its producing little more than stalks or bents, will be only found valid when the plant grows in upland pasture and dry situations: in rich moist meadows its foliage is more abundant, and it seems to be the general opinion of agriculturists, that it is highly ac-

ceptable and nutritious to cattle. As its foliage is of rapid growth, and its flowering stems are continually shooting forth, it should never be sown to form a lawn, grass-plat, or bowling-green.

The produce of some turfs sent me by Mr. LOVEDEN, and cut out of his best meadows, consisting chiefly of *Lolium perenne*: much yet remains to be known of this most common grass, which appears to vary, *ad infinitum*, even in its wild state; we have seen a variety of it with double flowers, and one with awns, both of which are very uncommon: the spike, where the plant grows luxuriantly, is sometimes found branched; seeds of this variety do not constantly produce the same: the battledoor variety is very common; in some pastures, and such as were not very moist, we have seen its stalks viviparous towards autumn; in some situations again we have seen it produce foliage chiefly, in others little besides flowering stems, and to prove almost annual.

As we have, in many instances, improved varieties of plants, for agricultural and other purposes, so we think it highly probable that such might be obtained from this grass.

POA AQUATICA.

Water, or Reed Meadow-Grass.

Like the *Flote Fescue*, is properly an aquatic, growing naturally in standing waters, or land that is periodically overflowed; in flat countries, which do not admit of being sufficiently drained, it is almost the only grass for hay and pasturage.

POA ANNUA.

Dwarf Meadow-Grass.

A grass common to every quarter of the globe; when cold does not prevent it, perpetually flowering and seeding, and that most rapidly; growing in almost any soil and situation, varying in size, but never acquiring any great height; its foliage tender and grateful to cattle, but liable to be killed by winter's frost, and summer's drought; the first to cover earth made bare, from any cause, hence frequent on the edges of paths, where its seeds being scattered, quickly vegetate, and where it is not overpowered by more luxuriant herbage; not flourishing from being trodden on, as Mr. STILLINGFLEET has supposed.

PHALARIS ARUNDINACEA.

Reed Canary-Grass.

The foliage of this grass is coarse, but very productive, and there is a sweetness in it which inclines one to think that it would be very grateful to cattle : where crop, or great quantity of fodder is the object, we would recommend the planting this grass, with *Festuca elatior*, in wet meadow-ground.

PHLEUM PRATENSE.

Meadow Cats-Tail Grass.

Affects wet situations, is very productive, but coarse and late ; has no excellence, that we are acquainted with, which the *Alopecurus pratensis* does not possess in an equal degree.

TRITICUM REPENS.

Creeping Wheat-Grass, vulgo Couch Grass.

Well known to farmers and gardeners as a most troublesome weed ; how far its early foliage may recommend it for pasturage, we shall not presume to determine.

DIRECTIONS

FOR SOWING THE GRASS SEEDS.

If a piece of ground can be had, that is neither very moist nor very dry, it will answer for all the seeds; they may then be sown on one spot: but if such a piece cannot be obtained, they must be sown on separate spots, according to their respective qualities, no matter whether in a garden, a nursery, or a field, provided it be well secured and clean. Dig up the ground, level, and rake it; then sow each kind of seed thinly in a separate row, each row nine to twelve inches apart, and cover them over lightly with the earth; the latter end of August, or beginning of September, will be the most proper time for this business. If the weather be not uncommonly dry, the seeds will quickly vegetate, and the only attention they will require, will be to be carefully weeded, in about a fortnight from their coming up; such of the plants as grow

thickly together may be thinned, and those which are taken up transplanted, so as to make more rows of the same grass.

If the winter should be very severe, though natives, as seedlings, they may receive injury; therefore it will not be amiss to protect them with mats, fern, or by some other contrivance.

Advantage should be taken of the first dry weather in the spring, to roll or tread them down, in order to fasten their roots in the earth, which the frost generally loosens; care must still be taken to keep them perfectly clear from weeds. As the spring advances, many of them will throw up their flowering stems, and some of them will continue to do so all the summer. As the seed in each spike or panicle ripens, it must be very carefully gathered, and sown in the autumn, at which time the roots of the original plants, which will now bear separating, should be divided and transplanted, so as to form more rows; the roots of the *Smooth-Stalked Meadow Grass*, in particular, creepinglike *Couch-Grass*, may readily be increased in this way; and thus, by degrees, a large plantation of these grasses may be formed, and much seed collected.

While the seeds are thus increasing, the piece or pieces of ground which are intended to be

laid down, should be got in order. If very foul, perhaps the best practice (if pasture land) will be, to pare off the sward, and burn it on the ground; or, if this practice should not be thought advisable, it will be proper to plough up the ground, and harrow it repeatedly, burning the roots of *Couch-Grass*, and other noxious plants till the ground is become perfectly clean; some cleansing crop, as potatoes, turnips, tares, &c. may contribute to this end.

By this means the ground we propose laying down will be got into excellent order, without much loss; and being now ready to form into a meadow or pasture, should be sown, broad-cast, with the following composition:

Meadow Fox-Tail, one pint; *Meadow Fescue*, ditto; *Smooth-stalked Meadow*, half a pint; *Rough-Stalked Meadow*, ditto; *Crested Dog's-Tail*, a quarter of a pint; *Sweet-Scented Vernal*, ditto; *Dutch Clover* (*Trifolium repens*), half a pint; *Wild Red Clover* (*Trifolium Pratense*), or, in its stead, *Broad Clover* of the shops, ditto. For wet land, the *Crested Dog's Tail*, and *Smooth-stalked Meadow* may be omitted, especially the former.—*Vid. Observ. on Cynosurus crist*, and *Poa prat*.

Such a composition as this, sown in the proportion of about three bushels to an acre, on a suitable soil, in a favourable situation, will, I am bold to assert, form in two years a most excellent meadow ; and, as all the plants sown are strong, hardy, perennials, they will not easily suffer their places to be usurped, by any noxious plants, which, by manure, or other means, in spite of all our endavours, will be apt to insinuate themselves ; if they should, they must be carefully extirpated, for such a meadow is deserving of the greatest attention ; but, if that attention cannot be bestowed on it, or if, in process of time, weeds should predominate over the crop originally sown, the whole should be ploughed up, and fresh sown with the same sort of seeds, or with a better composition, when such shall be discovered ; for I have no doubt, but, at some future time, it will be as common to sow a meadow with a composition, somewhat like this, as it now is to sow a field of wheat or barley.

If the object of the agriculturist be the improving of a meadow merely, not the laying it down, then, after eradicating as much as possible all noxious plants, let some old rotten dung be thinly spread over the meadow, in the begin-

ning of September, at which time the worms * throw up great quantities of earth, which contributes greatly to prevent the growth of moss, as well as affords fresh soil for the roots of plants to shoot into, and for seeds to vegetate in; bush harrow it, and sow on it the same composition of seeds, but in a smaller quantity; if the meadow be very rich, the dung will be less necessary.

* The natural diggers and dingers of land, worm-casts being nothing more than the dung of the worm.

AN
ENUMERATION
 OF THE
BRITISH GRASSES.

GENUS I.

AGROSTIS, BENT GRASS (a).

- 1 *Spica venti*. *L.* 110, *H.* 30. *R.* 405.
 n. 17, - - * Bearded.
- 2 *Stricta* (*b*). - - * Upright.
- 3 *Fascicularis* (*c*). *Canina*. *L.*? *H.* *var.*
 can., *q* - - * Tufted-Leaved.

(a) I have experienced more difficulty in ascertaining the several species of this genus, than all the others put together; ten of them, now growing in my garden at Brompton, continue constant to their characters; the *minima* is no *Agrostis*, though here continued as such, but a distinct genus.

(b) We have changed the name of *rubra*, by which we have heretofore distinguished this species, for that of *stricta*, it being more perfectly upright than any of the other perennial species.

(c) *Tenuifolia* ed. 2. Have changed this name for the more expressive one of *fascicularis*, the stalks in autumn producing leaves in bundles.—*Vid. Scheuchz. Specif. Descr.*

- 4 *Setacea*. *H. var. can.* 7. *Fl. Lond. Fasc. 6* * Sheeps-Fescue-
Leaved.
- 5 *Alba* (*d*). *L.* 111. " " * White.
- 6 *Palustris*. " " " * Marsh.
- 7 *Capillaris* (*e*). *R.* 404, 10. *Huds. var.*
polymorp. " " " * Fine-Panicked.
- 8 *Repens* (*f*). *Dodon, Pempt.* p. 558.
Gramen. " " " * Couchy.
- 9 *Lobata* (*g*). " " " * Lobed.
- 10 *Littoralis*. " " " Sea-Side.
- 11 *Minima*. *L.* 111. *H.* 32. *R. India*
Pl. dub. " " " * Least.

GENUS II.

AIRA. HAIR GRASS.

- 1 *Aquatica*. *L.* 112, *H.* 33, *R.* 402.
3. *Fl. Lond.* " " " * Water.
- 2 *Caspitosa*, *L.* 112. *H.* 34, *R.* 403, 5. * Turfy.

(*d*) We used to regard the *alba* and *palustris* as one and the same species, but we have lately found them to be very distinct; in the *alba*, the branches of the panicle, which is for the most part of a pale hue, close after blowing; in the *palustris*, they remain spread out:—the seed of *palustris* is twice the weight of that of *alba*.

(*e*) Frequently found awned.

(*f*) Like *capillaris*, but larger in every respect; root powerfully creeping; the common couch of the farmer.

(*g*) Finding this maritime species noticed originally by us on the Devonshire coast, not confined to sandy soils, we have changed the name of *arenaria* for that of *lobata*, the panicle being more obviously divided into lobes, than any of the other species; it comes very near to *alba*,

- 3 *Flexuosa*. L. 112. H. 34. R. 407. 8. *Heath.
 4 *Montana*. L. 112. H. 35. - - *Mountain.
 5 *Canescens*. L. 112. H. 36. R. 405. 16. *Grey.
 6 *Præcox*. L. 112. H. 36. R. 407. 10.
 t. 22. f. 2. Fl. Lond. - - *Early.
 7 *Caryophyllea (h)*. L. 112. H. 36. R.
 407. 7. - - - *Silver.

GENUS III.

ALOPECURUS. FOX-TAIL GRASS.

- 1 *Pratensis*. L. 108. H. 27. R. 396. 1.
 Fl. Lond. - - - *Meadow.
 2 *Agrestis*. L. 108. H. 27. *myosuroides*,
 ed. 1. R. 397. 1. Fl. Lond. my-
 osuroides. - - - *Field.
 3 *Geniculatus*. L. 108. H. 27. R. 396.
 2. *Fl. Lond.* - - - *Flote.
 4. *Bulbosus*. L. 108. H. *var. Genucula-*
 tus β. R. 397. 3. *t. 20. f. 2.* - *Bulbous.
 5 *Monspeliensis*. L. 109. H. 28. *Alop.*
 aristatus R. 396. 4. - - *Bearded.

GENUS IV.

ANTHOXANTHUM. VERNAL-GRASS.

- 1 *Odoratum*. L. 73. H. 11. R. 498.
 § *Fl. Lond.* - - - *Sweet-Scented.

(h) For what purpose could Mr. STILLINGFLEET give a figure of this insignificant annual?

GENUS V.

ARUNDO. REED-GRASS.

- 1 *Phragmitis*. *L.* 123. *H.* 53. *R.* 401. 1. *Common.
- 2 *Calamagrostis*. *L.* 123. *H.* 54. *R.* 401. 2. *Wood.
- 3 *Epigejos*. *L.* 123. ? *H.* 54. *R.* 401. 3. - *Small.
- 4 *Arenaria*. *L.* 123. *H.* 54. *R.* 393. 1. *Sea.

GENUS VI.

AVENA. OAT-GRASS.

- 1 *Elatior*. *L.* 121. *H.* 53. *R.* 406. 3, 4.
Fl. Lond. - - - - *Tall.
- 2 *Pratensis*. *L.* 122. *H.* 52. *R.* 405.
t. 21. *f.* 1. - - - *Meadow.
3. *Pubescens*. *L.* 122. *H.* 52. *R.* 406.
t. 21. *f.* 2. - - - *Rough.
- 4 *Flavescens*. *L.* 122. *H.* 53. *R.* 407.
5. Fl. Lond. - - - *Yellow.
- 5 *Nuda*. *L.* 122. *H.* 52. *R.* 389. 6. - *Naked.
- 6 *Fatua*. *L.* 122. *H.* 52. *R.* 389. 7. - *Bearded,

GENUS VII.

BRIZA. QUAKING-GRASS.

- 1 *Media*, *L.* 115. *H.* 38. *R.* 412. 1. - *Common.
- 2 *Minor*. *L.* 115. *H.* 38. *R.* 412. 2. - *Small.

GENUS VIII.

BROMUS. BROME-GRASS.

- 1 *Mollis*. L. 119. H. 48. *polymorphus*.
R. 413. *Fl.* 5. *Lond.* - - - *Soft.
- 2 *Secalinus*. L. 119. H. 49. *polymorphus*.
var. γ. *R.* 414. 8. - - - *Lob.
3. *Squarrosus*. L. 119. H. 49. - - - *Corn.
- 4 *Erectus*. H. 49. *R.* 413. 2. - - - *Upright.
- 5 *Diandrus*. H. 50. *Fl. Lond.* - - - *Diandrous.
- 6 *Sterilis* L. 120. H. 50. *R.* 412.
1. *Fl. Lond.* - - - *Barren.
- 7 *Gigantetus*. L. 120. H. 51. *R.* 415.
11. *Fl. Lond.* - - - *Tall.
- 8 *Hirsutus*. L. 119. *asper*. H. 51. *ne-*
moralis, *R.* 415. 10. *Fl. Lond.* - *Hairy.
- 9 *Arvensis* (*i*). L. 120. - - - *Field.
- 10 *Racemosus*. L. 120. - - - *Smooth.
- 11 *Multiflorus* (*k*). *Weigel. Observ.* 2.
t. l. f. l. - - - *Many-Flowered.
- 12 *Coytzei* (*l*) - - - *Coytes.

(i) We have a grass growing in our garden, but which has not yet flowered, communicated to us by Mr. DICKSON, under this name.

(k) Found by us last summer in Battersea-Fields.

(l) Found wild in Wales, by my friend Dr. CORRE, of Ipswich, author of the *Hortus Gippovicensis*, who sent me seeds of it, which have for many years produced the same plant, without any variation, in my Garden at Brompton. It is very near related to *Bromus mollis*, and might be mistaken for a dwarf variety of that plant; its spiculæ are much larger in proportion, and the groove in the middle of them much deeper, and more conspicuous.

GENUS IX.

CYNOSURUS. DOGS-TAIL-GRASS.

- 1 *Cristatus*. *L.* 116. *H.* 59. *R.* 398. 2. *Crested.
- 2 *Echinatus*. *L.* 116. *H.* 59. *R.* 397. 5. *Rough.
- 3 *Cœruleus*. *L.* 117. *H.* 59. *R.* 399. 4. *Blue.

GENUS X.

DACTYLIS. COCK'S-FOOT-GRASS.

- 1 *Glomerata*. *L.* 116. *H.* 43. *R.* 400. 2. *Rough.
- 2. *Maritima*. *H.* 43. *Cynosuroides*. *R.*
393. 4. - - - - Sea.

GENUS XI.

ELYMUS. LYME-GRASS.

- 1 *Arenarius*. *L.* 125. *H.* 56. - - *Sea.
- 2 *Geniculatus*. - - - *Elbowed.
- 3 *Caninus*, *L.* 125. *H.* 58. *Triticum ca-*
ninum. *R.* 390. 2. - - - *Dogs.

GENUS XII:

FESTUCA. FESCUE-GRASS.

- 1 *Bromoides*. *L.* 118. *H.* 46. *R.* 415. 13. *Barren.
- 2 *Myurus*, *L.* 118. *H.* 46. *R.* 415. 12. *Wall.

- 3 Ovina. *L.* 118. *H.* 44. *R.* 410. 9. - *Sheeps.
 4 Nana. - - - *Dwarf.
 5 Glaucescens. - - - *Glaucouscent.
 6 Glauca. - - - *Glaucous.
 7 Duriuscula. *L.* 118. *H.* 44. *R.* 413
 4. *t.* 19. *f.* 1. - - *Hard.
 8 Cambrica. *H.* 45. - - *Welsh.
 9 Decumbens. *L.* 119. *H.* 47. *R.* 408.
 11. - - - *Decumbent.
 10 Pratensis. *H.* 47. *var. fluitans. γ.*
 R. 411. 16. *Fl. Lond.* - - *Meadow.
 11 Elatior. *L.* 118. *H.* 47. *R.* 411. 14.
 Fl. Lond. - - - *Tall.
 12 Loliacea. *H.* 47. *var. fluitans. var. β.*
 Fl. Lond. - - - *Darnel.
 13 Fluitans. *L.* 119. *H.* 46. *R.* 412. 17.
 Fl. Lond. - - - *Flote.
 14 Pinnata. *H.* 48. *R.* 392. § - - *Spiked.
 15 Rubra. *L.* 118. *H.* 45. - - Purple.
 16 Glabra. *Lightfoot Fl. Scot. App.*
 p. 1085. - - - Smooth.
 17 Uniglumis. *H.* 55. *Lolium bromoides.*
 R. 413. 3. *t.* 17. *f.* 2. - - *Sea.
 18 Sylvatica. *L.* 120. *Bromus pinnatus.*
 H. 48. *R.* 394. § - - *Wood.

GENUS XIII.

HORDEUM. BARLEY-GRASS.

- 1 Murinum L. 126. H. 56. R. 391.
 1. Fl. Lond. - - - *Wall.
 2 Maritimum. H. 57. Marinum. R. 392. 3. *Sea.
 3 Pratense. H. 56. R. 392. 3. - - *Meadow.
 4 Sylvaticum. H. 57. L. 125. *Elymus*
 Europæus. R. 392. 4. - - *Wood.

GENUS XIV.

HOLCUS. SOFT-GRASS.

- 1 Mollis. L. 905. H. 440. R. 404. 15.
 Fl. Lond. - - - *Creeping.
 2 Lanatus. L. 905. H. 440. R. 404.
 14. Fl. Lond. - - *Meadow.

GENUS XV.

LOLIUM. DARNEL-GRASS.

- 1 Perenne. L. 124. H. 55. R. 395. 2. *Perennial or
 Ray-Grass.

- 2 Temulentum. L. 124. H. 55. R. 395. 1. * Annual.
 3 Arvense (m) - - - - * Field.

GENUS XVI.

MELICA. MELIC-GRASS.

- 1 Uniflora. H. 37. *nutans*. R. 403. 6.
Fl. Lond. - - - * Single-Flowered.
 2 Nutans. L. 112. H. 37. *montana*.
R. 403. 7. Fl. Lond. - - * Mountain.
 3 Cærulea. L. 113. H. 33. *Aira cærulea*.
R. 404. 8. Fl. Lond. - - * Blue.

GENUS XVII.

MILIUM. MILLET-GRASS.

- 1 Effusum. L. 109. H. 29. R. 402. 1. *Fl.*
Lond. - - - * Wood.
 2 Lendigerum. L. 109. H. 23. *Alopecurus ventricosus*. R. 394. 4. - * Corn.

(m) Received from Mr. DICKSON, who informs me that it is found wild in the corn-fields, in some parts of Scotland; it has the perfect habit of a *Lolium*, but is deficient in the character of that genus, the calyx being constantly bivalve.

GENUS XVIII.

NARDUS. MAT-GRASS.

- 1 *Stricta*. *L.* 102. *H.* 22. *R.* 393. 2. *Small.

GENUS XIX.

PANICUM. PANIC-GRASS.

- 1 *Viride*. *L.* 105. *H.* 24. *R.* 399. 1. *Fl.*
Lond. - - - *Green.
- 2 *Verticillatum*. *L.* 105. *H.* 24. *R.* 394.
 3. *Fl. Lond.* - - - *Whorled.
- 3 *Crus-galli*. *L.* 105. *H.* 24. *R.* 394.
 2. *Fl. Lond.* - - - *Loose.
- 4 *Sanguinale*. *L.* 106. *H.* 25. *R.* 399.
 2. *Fl. Lond.* - - - *Cock's-Foot.
- 5 *Dactylon*. *L.* 106. *H.* 25. *R.* 399. 1. *Creeping.

GENUS XX.

POA. MEADOW-GRASS.

- 1 *Aquatica*. *L.* 113. *H.* 38. *R.* 411.
 13. *Fl. Lond.* - - - *Water or Reed.
- 2 *Alpina*. *L.* 113. *H.* 39. *var.* - *Alpine.
- 3 *Glauc.* - - - *Glaucous.

- 4 Trivialis. L. 113. H. 39. R. 409.
 3. Fl. Lond. - - - * Rough-Stalked.
- 5 Pratensis. L. 113. H. 39. R. 409.
 2 Fl. Lond. - - - * Smooth-Stalked.
- 6 Nemoralis. L. 115. H. 40, *angustifolia*. - - - * Wood.
- 7 Compressa. L. 115. H. 41. R. 409. * Flat-Stalked.
- 8 Annua. L. 113. H. 42. R. 408. 1. * Dwarf.
- 9 Maritima. H. 42. R. 409. 6. - * Sea.
- 10 Retroflexa. L. 115. *distans*? H. 34.
 var. *Aira aquat.* - - - * Reflexed.
- 11 Rigida. L. 114. H. 42. R. 410. 8.
 Fl. Lond. - - - * Hard.
- 12 Cristata. L. 115. H. *Aira cristata*.
 33. R. 396. 3. - - - * Crested.
- 13 Loliacea. H. 43. R. 395. 4. - - * Darnel.
- 14 Procumbens. Fl. Lond. - - - * Procumbent.
- 15 Angustifolia. Linn. p. 113. - - - * Narrow-Leaved.
- 16 Elatior (n). - - - * Tall.
- 17 Tenuiflora (o). - - - * Slender-Flowered.

GENUS XXI.

PHLEUM. CAT'S-TAIL-GRASS.

- 1 Arenarium. L. 108. H. 23. *Phalaris*
 arenaria. R. 398. 4. - - - * Sea. -

(n) From Scotland.

(o) Found by us last Summer in Battersea-Fields: like *Nemoralis*, but distinct.

- 2 Pratense. L. 107. H. 25. R. 398. 1. *Meadow.
 3 Nodosum. L. 108. H. var. *pratense*. *Bulbous.
 4 Alpinum. L. 108. *Alpine.
 5 Paniculatum. H. 26. *Branched.

GENUS XXII.

PHALARIS. CANARY-GRASS.

- 1 Phleoides. L. 104. *Cat's-Tail.
 2 Canariensis. L. 103. H. 23. *Birds.
 3 Arundinacea. L. 104. H. 23. R. 401. 1. *Reeds.

GENUS XXIII.

ROTBOELLIA. HARD-GRASS.

- 1 Incurvata. L. 124. H. 441. *Ægilops*
incurva R. 395. 3. *Sea.

GENUS XXIV.

STIPA. FEATHER-GRASS.

- 1 Pennata. L. 121. H. 29. R. 393. 3. *Long-Awned.

GENUS XXV.

TRITICUM. WHEAT-GRASS.

- 1 Junceum. *L.* 127. *H.* 58. *R.* 391. 4. * Rushy.
2 Repens *L.* 127. *H.* 57. *R.* 390. - * Creeping or
Couchy.

All those grasses which have an asterisk before their English names, in number one hundred and fifteen, are at present growing in my Botanic Garden, *Brompton*.—*L.* refers to the 14th Edition of the *Systema Vegetabilium* of LINNÆUS, published by Professor MURRAY, *Gottingæ*, 1784.—*H.* refers to the 2d. Edition of Mr. HUDSON's *Flora Anglica*.—*R.* to the 3d Edition of Mr. RAY's *Synopsis*.—And *Fl. Lond.* to the *Flora Londinensis*, in which the grasses so referred to, are figured of their natural size.

In this Catalogue there are twenty-eight more species enumerated than in STILLINGFLEET, and thirty-one more than in the last edition of Mr. HUDSON's *Flora Anglica*; we have little doubt but some of these will prove varieties, as

Aira 4, Festuca 12, and Poa 7: and some have perhaps no right to appear in a British list, as Avena 5, and Phalaris 2.

We are far from considering this Catalogue as complete; but, if it has no other use, it may excite others to make it so: though the word complete can but seldom be applied with propriety to any part of Natural History, as new subjects are perpetually discovered, which often make it necessary, not only to add to, but to alter, names and descriptions that have been long established.

BOTANIC GARDEN,

Brompton, 1798.

APPENDIX.

IF we examine our meadows, pastures, and downs, we shall find them pretty much in a state of nature, and excepting those pastures which of later years have been sown with Ray-grass and Clover, full of an indiscriminate mixture of plants, some of which afford good, others bad food; some good crops, others scarcely any crops at all: that I may not be thought to speak at random on this subject, I shall here mention a few facts to corroborate what I have asserted.

My very worthy and much esteemed friend, THOMAS WHITE, Esq. with a view to ascertain the produce of several downs and commons, fed on by sheep, procured from each of those under-mentioned, in Hampshire and Sussex, a turf, which, though not more than six inches in diameter, and chosen indiscriminately, produced, on being planted in my garden, as follows:

TURF FROM SELBORN-COMMON.

Plantago lanceolata.
Agrostis capillaris.
Avena flavescens.
Dactylis glomerata.
Festuca duriuscula.
Poa annua.
Cynosurus cristatus.
Trifolium repens.
Crepis tectorum.
Achillea millefolium.
Galium verum.
Hypochaeris radicata.
Hieracium pilosella.
Thymus Serpyllum.

TURF FROM OAKHANGER.

Trifolium repens.
Holcus lanatus.
Poa annua.
Agrostis capillaris.
Agrostis palustris.

TURF FROM DEORTUN.

Ranunculus repens.
Lolium perenne.

Holcus lanatus.
Prunella vulgaris.
Festuca duriuscula.
Agrostis palustris.
Trifolium repens.
Crepis tectorum.
Achillea millefolium.

TURF FROM GLYND-HILL,

Medicago lupulina.
Achillea Millefolium.
Poa paratensis.

TURF FROM THE SAME.

Avena flavescens.
Festuca duriuscula.
Festuca ovina.
Hieracium pilosella.
Agrostis capillaris.
Trifolium repens.
Thymus serpyllum.

TURF FROM SHORT HEATH,

Festuca bromoides.
Aira præcox.

Juncus campestris.

Poa annua.

Agrostis capillaris.

TURF FROM MOUNT CABRON.

Rumex Acetosa.

Daucus Carota.

Medicago lupulina.

Poterium sanguisorba.

Festuca duriuscula.

Avena flavescens.

TURF FROM RINGMER DOWN.

Linum catharticum.

Scabiosa columbaria.

Ornithopus purpusillus.

Avena flavescens.

Festuca duriuscula.

Trifolium repens.

Hypochæris radicata.

Crepis tectorum.

Lotus corniculatus.

Juncus campestris.

Hieracium pilosella.

Festuca ovina.
Thymus serpyllum.
Poa pratensis.

Flor. Lond.

It is, perhaps no small recommendation to the *Poa trivialis*, that it is a principal grass in that uncommonly productive meadow near Salisbury, mentioned by STILLINGFLEET, and more particularly described in the Memoirs of the Bath Agricultural Society, vol. 1. p. 94.

The account given of the extraordinary fertility of this meadow excited our curiosity, and induced us to request a gentleman residing near the spot, to favour us with six small turfs, cut up in different parts of the said meadow, and which, being planted in our garden, Lambeth-Marsh, produced as follows:

TURF I.

Poa trivialis.
Ranunculus acris.

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Triticum repens.
Agrostis palustris.

TURF 2.

Poa trivialis.
Alopecurus pratensis.
Triticum repens.

TURF 3.

Poa trivialis.
Agrostis palustris.

TURF 4.

Poa trivialis.
Triticum repens.
Peucedanum Silaus.

TURF 5.

Poa trivialis.
Alopecurus pratensis.
Agrostis palustris.
Avena elatior.
Triticum repens.

This experiment proves, in a great degree at least, what we long before suspected, that the extraordinary fertility of this meadow arose not from any new grass peculiar to it, but from several unusual circumstances concurring and favouring, in an uncommon degree, the growth of certain well-known grasses ; especially the *Poa trivialis* and *Agrostis palustris*.

HINTS

RELATIVE TO THE

IMPROVEMENT OF MEADOWS.

It appears to us that, in the herbage of a good meadow, there must be a combination of

Produce,
Bateableness, and
Early Growth.

PRODUCE.

This, in most cases, is the Agriculturist's grand object—and no wonder, since it is the quantity chiefly which enables him to pay his rent, and support his cattle ; to obtain this, the judicious husbandman spares no expence in labour or manure ; but it does not follow, that produce is to be attended to solely, or that, for its sake, we are to cultivate *Rough Cock's-Foot-Grass, Meadow-Sweet*, and such coarse plants.

Grasses,

Grasses, which have been recommended for being remarkably grateful to cattle, as the *Sheep's Fescue-Grass*, or for the sweetness of their foliage merely, if they are found to be deficient in the grand article of produce, will never answer the farmer or grazier's purpose, since to be a good meadow it must be productive.

Cattle, in regard to food, doubtless have their particular likings *, in which it may be necessary sometimes to indulge them: but this practice must not be carried too far; for, as the farmer cannot afford to feed his ploughmen on pigs and poultry, neither can he indulge his cattle, in general, with the finer or more delicate hay or

* How inadequate we are to judge of the likings of animals, the following fact may serve to shew:—my garden at Brompton was, in the spring of 1789, infested by one or more hares, for several months, who did considerable damage to many of my plants; but the one by which their depredations were first discovered, was the *Juncus nitens*, the blossoms and flowering stems of which they cropped, and neglecting or slightly touching a vast number of other plants, even the *Agrostis Cornucopiæ* of WALTER'S *Flor. Carol.* to which animals have been reported to be much attached, and another sweeter grass, both growing just by, nightly resorted to, and ate the *Juncus* to the very ground.—Of the British grasses, the hare has preferred the *Poa procumbens*.

herbage. By the bye, we do not know, but that the most productive grasses may also be the most nutritious, or that cattle will not as eagerly eat the herbage or hay made of the *Meadow Fox-Tail-Grass*, as of the *fine Bent* (*Agrostis capillaris*), and *procumbent Trefoil* (*Trifolium procumbens*).—Moreover, cattle are known frequently to thrive on food to which they are habituated by necessity, though at first they could scarcely be prevailed on to touch it.

Persons, in making experiments, are very apt to conclude too hastily from the appearance which a plant assumes on its being first planted or sown; the most insignificant vegetable will often make a great shew, when its fibres have fresh earth to shoot into; but the trial comes, when the object of our experiment has been in a meadow or pasture several years, when its fibres, from long growth, are matted together, and it meets with powerful neighbours, to dispute every inch of ground with it; if it then continues to be productive, it must have merit. We see that *Lucern*, when left to itself, is soon overpowered; if we sow *Broad-leaved Clover*, which is most undoubtedly a perennial, the first year we shall have a great crop of *Clover*; let this field be left to itself, and the *Clover*, like the

Lucern, will yearly diminish, not because it is a biennial, as some have supposed, but because plants hardier or more congenial to the soil, usurp its place: this shews, then, that at the same time that we introduce a good plant, that plant must also be a powerful one, able to keep possession, and continue to be productive.

BATEABLENESS.

The word *bateable* is altogether agricultural, perhaps provincial, and used to express cattle's thriving on the food they eat.

This is, undoubtedly, of great consequence, and it is to be regretted, that our knowledge of *bateable* herbage is so limited; of those plants which have been cultivated, we are able to speak with some certainty; it is well known that *Clover*, *Lucern*, *Saintfoin*, *Tares*, and several other plants, have a tendency to fatten cattle; but what grasses, or other plants, which have not been subjected to a separate cultivation, have this particular tendency, remains to be ascertained by experiment.

As leguminous plants in general, are found to agree with cattle, we may reasonably con-

clude that a certain quantity of them must be proper in pastures.

Certain pastures are found to be more batable than others ; but whether this arises from situation, or their particular produce, remains also to be discovered.

We should be thankful to any nobleman or gentleman, for turfs cut up in pastures, remarkable for this quality, or the contrary, that we might ascertain their produce at least.

EARLY GROWTH.

The farmers and graziers of this country unitedly complain of the want of early herbage in the spring : those plants, therefore, which are found to put forth early foliage, and to be grateful to the cattle, are deserving of great attention : as far as grasses are concerned, the *Sweet-scented Vernal*, the *Meadow Fox-Tail*, the *Smooth* and *Rough-Stalked Meadow-Grass*, will effect all that can be expected from those of British growth ; much, very much, however, will depend on seasons ; if the winter be very severe, or north-easterly winds prevail in the spring, grassy herbage will be backward : to counteract

the bad effects of such seasons, our pastures should be warmly situated, not drenched with moisture, sheltered by thick hedges, and divided into small enclosures; in short, a set of enclosures should be formed for this very purpose, where there is a prospect of its answering.

Where early pasturage is the desideratum, other plants, as well grasses, may deserve a place amongst them, as *Rib-wort*, or *Rib-Grass* (*Plantago lanceolata*), *Dandelion* (*Leontodon Taraxacum*), *Broad-leaved Clover* (*Trifolium pratense*), with many others.

As early herbage is valuable for pasturage, it is not less so for hay: by the middle of May at furthest, a meadow of this sort would be fit for mowing, and the second hay-making might commence by the time that hay-making usually takes place in the country.

We have sometimes thought, but, perhaps, the idea is too speculative, that we ought to have two sorts of meadows—one for hay, the other for pasture; that our hay meadows should consist entirely of grasses, and chiefly for this reason, that the hay would, on that account, be much sooner made, an object of consequence at all times, but more so when the process com-

mences in May; in June and July the more powerful heat of the sun is able to exsiccate the thick leaves and stalks of the more succulent plants; but in the necessary prolongation of this business, the grasses must materially suffer.

AQUATIC GRASSES.

ADDENDA, 1812.

The following description of certain Aquatic Grasses, is extracted from the Flora Londinensis of the late Mr. Curtis.

FESTUCA FLUITANS. FLOTE FESCUE-GRASS

FESTUCA. *Linn. Gen. Pl.* TRIANDRIA
DIGYNIA.

Raii Gen. 27. HERBÆ GRAMINIFOLIÆ
FLORE IMPERFECTO CULMIFERÆ.

FESTUCA panicula ramosa erecta, spiculis
subsessilibus, teretibus muticis. *Linn. Syst.*
Veg. p. 102. *Fl. Suec. p.* 32.

POA locustis teretibus multifloris, glumis floralibus exterioribus truncatis, interioribus bifidis. *Haller Hist. p. 219. n. 1453. v. 2.*

POA fluitans. *Scopoli Fl. Carn. p. 73.*

GRAMEN aquaticum fluitans, multiplici spica.
Bauh. Pin. 2

GRAMEN aquaticum cum longissima panicula.
J. Bauhin II. 490. Raii Syn. p. 412.
Flote-Grass.

GRAMEN fluviatile. *Ger. emac. 14. Park.*
1275. Hudson Fl. Angl. p. 38. Oeder.
Fl. Dan. t. 237. Schreber Gram. tab. 3.
Stillingfleet Misc. tab. 10.

RADIX perennis, in limum profunde penetrans.
CULMUS pro ratione loci pedalis ad tripedalem, basi repens surculosque promens, dein suberectus, vaginis foliorum ad paniculam usque amictus.

VAGINÆ foliorum compressæ, subancipites, striatæ.

FOLIA latiuscula, lævia; *surculorum* erecta, carinata, breviuscula, *caulina* longiora, planiuscula, flaccida, aquis tempore hybernæ prostrata.

PANICULA longa, inclinata, nonnunquam subspicata, sæpius vero ramosa, ramis nunc cauli adpressis nunc distantibus, ut pinxit
CL. SCHREBERUS.

SPICULÆ tenues, teretes, unciales aut sesquiuunciales, 9 ad 12 floræ, rachi adpressæ.

CALYX: **GLUMA** bivalvis, valvulis inæqualibus, membranaceis.

COROLLA bivalvis, valvulæ longitudine æquales, calyce majores, *inferiore* majore,

TRANSLATION.

ROOT perennial, striking deep into the mud.

STALK according to its place of growth from one to three feet in length, creeping at bottom, and sending forth young shoots, afterwards nearly upright; covered with the sheaths of the leaves as far as the panicle.

SHEATHS of the leaves, flattened, two-edged, and striated.

LEAVES rather broad and smooth, those of the young shoots upright, keel-shaped, and shortish; those of the stalk longer, flattish, weak, and hanging down, in the winter season lying flat on the water.

PANICLE long, generally inclined or bending down a little, sometimes forming a kind of spike, but most commonly branched; the branches sometimes pressed to the stalk, sometimes diverging from it in the manner represented by SCHREBER.

SPICULÆ slender, round, an inch or an inch and a half long, producing from 9 to 12 flowers, pressed to the stalk.

CALYX: a **GLUME** of two valves, which are unequal and membranous.

COROLLA of two valves, which are of an equal length and bigger than the calyx, the *lower*

concava, lineata, nervis apicæ sæpe coloratis, apice membranacea, obtusiuscula, sæpius erosa ; *superiori* lanceolata, compressa, bicuspidata.

STAMINA: FILAMENTA tria capillaria, ANTHERÆ flavæ aut purpurascentes, oblongæ.

PISTILLUM: GERMEN ovatum, STYLI duo subulati, reflexi, STIGMATA ramosissima.

NECTARIUM glandula squamiformis, cordata, horizontalis, ad basin germinis.

SEMEN oblongum, nitidum, olivaceum, bicorniculatum, nudum.

TRANSLATION:

valve largest, concave, and nervous, the nerves towards the top frequently coloured, at top membranous, rather blunt with uneven points, the upper valve more pointed, flat, and bifid.

STAMINA: three **FILAMENTS** very slender, **ANTHERÆ** oblong and yellow, or purplish.

PISTILLUM: **GERMEN** ovate, **STYLES** two tapering and bending back, **STIGMATA** very much branched.

NECTARY a small heart-shaped squamiform gland, placed horizontally at the bottom of the germen.

SEED oblong, shining, of an olive colour, with two little horns, and naked.

In speaking of the *Bromus mollis*, we had occasion to remark the great variety of appearance to which the grasses were subject from soil and situation, and this observation is equally applicable to the *Festuca Fluitans*.

This grass appears to thrive best in still waters, or gently running streams, where its numerous fibres penetrate easily into the mud; in such situations it becomes very luxuriant. The leaves are large, tender, and sweet, and the panicle becomes very much branched; but in meadows, where it is deprived of its natural quantity of water, it becomes in every respect less, and the panicle is frequently changed to a simple spike. When it has nearly done flowering, the branches of the panicle generally project from the main stalk, so as to form an acute angle. In every situation, whether the panicle be large or small, the spiculæ are always pressed close to the stalk or branches of the panicle; and this circumstance, joined to the length and roundness of the spiculæ, sufficiently characterize this species: if it should not, however, its parts of fructification afford at once a most pleasing and satisfactory distinction, *vid. fig. 6, 9, 10.*

We have often had the singular pleasure of observing this grass, soon after being gathered, expand its glumes, and expose its delicate yellow stamina, and still more delicate pistilla; and in this expanded state each spicula puts on a very different face, and seems to invite the student to its investigation; and would he wish to become acquainted with the structure of this useful tribe of plants, he cannot select one more proper for his purpose, as it may be found in almost every watery ditch, flowering from the beginning to the end of summer, and has all the parts of fructification which are peculiar to the grasses, large enough to be distinctly discerned even by the naked eye, and so exposed as to be visible without the trouble of dissection.

Modern botanists seem much divided whether they should consider this as a *Poa* or *Festuca*. As it does not appear to us that we should in the least advance our favourite science by altering its generic name, we have continued that of LINNÆUS, although we are by no means satisfied with his generic characters of the grasses in general, and are persuaded, that future observations, and a more accurate attention to the minute parts of their fructification, will place

those genera in a much clearer point of view than has yet been done by any author.

Professor **ÆDER**, in his **FLORA DANICA**, and the celebrated **SCHREBER**, in his **AGROSTOGRAPHIA**, have both given a figure of this grass. As we have not seen it growing either in *Denmark* or *Germany*, we cannot say that their figures do not express its particular mode of growth in those countries; but they do not convey to us its habit or manner of growing here. In both their figures the panicle is represented quite upright: whereas, with us it is always more or less inclined. This, however, is a matter of no great moment; a deviation from nature in the representation of the minute parts of the fructification is a matter of much greater consequence, and we are sorry to find that Mr. **SCHREBER**, whose knowledge and accuracy can seldom be called in question, has not been sufficiently attentive to all the parts which characterize this species. He has represented the styles as branched or feathered quite down to the germen; whereas they are evidently *naked at bottom*, and *much branched at top only*. The singular squamula or scale at the base of the germen he has properly noticed; but the *two little horns* at the top of the seed, which are the remains of the

styles, and which in a peculiar manner distinguish this important seed, he does not remark. In the *Flora Danica* the styles are likewise feathered down to the germen, and the squamula at the base of the germen wholly omitted.

This grass is found to be of considerable importance in the œconomy of nature.

The *Phalænæ Festuæ*, or *Gold Spot Moth*, to which LINNÆUS, with great propriety, adds the epithet of *pulcherrima* (*vid. Fauna Suecia*, p. 311. *Albin pl.* 84, *lit.* E. F. G. H.) is said by him to feed on this particular species : with us, however, it is always found on a different grass, *viz.* the *Poa aquatica*, or *large water Poa*. Its history, with the particular manner of finding it, will be given under that grass.

From the observations of late writers it appears, that several sorts of cattle are remarkably fond of this grass, particularly kine and hogs ; and that in the spring-time they are frequently enticed into bogs, by endeavouring to get at its sweet young shoots, which appear earlier than those of most other grasses.

“ Professor KALM, in a journey through part
“ of *Sweden*, observed the swine to go a great
“ way into the water after this grass, the leaves
“ of which they eat with great eagerness. On

" this he was tempted to try if they would eat
 " the same grass dried : he accordingly had
 " small bundles of it gathered, dried, and cast
 " before them ; the consequence was, they ate it
 " seemingly with as much appetite as horses do
 " hay ; hence he concludes that, by cultivating
 " this grass, *wet and swampy places* might be
 " rendered useful, and a great deal of corn,
 " &c. saved.

He who introduced the method of feeding
 hogs in summer time on clover, deserved very
 well of his country ; and if the hay of this grass
 would keep them in heart during the winter, it
 might prove a very valuable discovery.

Mr. KENT, in his *Hints to Gentlemen of
 Landed Property*, lately published, considers
 this as a most valuable grass, and assures us (*p.*
34.) it is to be improved above all others, and
 at a less expence, merely by flooding (*P. 54*)
 he informs us, that flooding destroys *all weeds*,
 and enriches the lands to a very high degree.
 (*P. 56*) he says, as rolling and pressure *bring*
 the *annual Meadow-Grass*, so flooding immedi-
 ately *begets* the *flote fescue*. These assertions
 of Mr. KENT bespeak neither the philosopher
 nor the accurately practical farmer ; they con-
 tain an exaggerated account of improving pas-

ture land by a particular process, but shew a great want of that minute attention which so important a subject required.

From a long residence in *Hampshire*, we well know, that the meadows in that county are considerably improved by flooding them, that is, stopping the water when there happens to be an unusual quantity, from violent or long continued rains, and by means of trenches or gripes, conveying the surplus water so as to overflow them entirely, if possible ; but we deny that by this process *all weeds* are destroyed, the use of *manure* superseded, or that *flote fescue grass* is immediately *begotten*. Although it is a constant practice with the farmers to flood their meadows in the winter, it is no less a constant practice, with such as wish to have good crops of grass, to manure them with dung or ashes. Flooding can no otherways destroy weeds than by altering the soil in which they grow ; and if it destroys one set of weeds, it must certainly favour the growth of another. If those plants which thrive best in a dry situation are destroyed by the alteration which now takes place in the soil, those which are fond of a moist situation will proportionably flourish. If the *flote fescue grass* was immediately produced by flooding, we should

find all those meadows which have undergone this operation to contain nothing but this kind of grass, whereas the richest and best meadows in *Hampshire* contain scarce a single blade of it. The fact is, this grass will not flourish in meadow land, unless you convert it into a kind of bog or swamp; and, I believe, few landed gentlemen will think this an improvement, or thank Mr. KENT for giving them such a hint.

Mr. STILLINGFLEET informs us, "that Mr. DEANE, a very sensible farmer, at *Ruscomb*, in *Berkshire*, assured him, that a field always lying under water, of about four acres, that was occupied by his father when he was a boy, was covered with a kind of grass that maintained five farm-horses in good heart from April to the end of harvest without giving them any other food; and that it yielded more than they could eat. He, at my desire, brought me some of the grass, which proved to be the *flote fescue* with a mixture of *marsh bent*. Whether this last contributes much towards furnishing so good pasture for horses, I cannot say: they both throw out roots at the joints of the stalks, and are therefore likely to grow to a great length. In the index of of dubious plants, at the end of RAY's *Sy-*

“ *nops*, there is mention made of grass, under the name of *Gramen caninum supinum longissimum*, growing not far from *Salisbury*, twenty-four feet long. This must, by its length, be a grass with a creeping stalk; and that there is a grass in *Wiltshire*, growing in watery meadows, so valuable than an acre of it lets from ten to twelve pounds, I have been informed by several persons. These circumstances incline me to think it must be the *flote fescue*; but whatsoever grass it be, it certainly must deserve to be inquired after.”

It may not be improper to add, that the account of the extraordinary long grass above mentioned was taken by Mr. RAY from the *Phytographia Britannica*, which mentions the particular spot where it grew, *viz.* at Mr. TUCKER's, at *Maddington*, nine miles from *Salisbury*; it is also remarked, that *they fat hogs with it*.

As it is now above a century since this inquiry was first made, it is not surprising, that no succeeding Botanic writer should have acquired satisfactory information concerning it? I am promised specimens of the roots and seeds.

Upon the whole, from the observations which we ourselves have made on this Grass, and from

what is to be collected from authors, it appears that if it be cultivated to any advantage, it must be in such meadows as are *naturally very wet and never drained*.

The quickest, and perhaps the best, method of propagating it would be by transplanting the roots at a proper season; and if the soil prove suitable, from the quickness of its growth, and its creeping stalk, it would soon exclude most other plants, and produce a plentiful crop.

In foreign countries the seed of this grass seems to be an object of more importance than the grass itself: the following is the substance of what Mr. SCHREBER has said concerning it (vid. *Beschreibung der Graser*, p. 40.) “ The seed
“ has a sweet and pleasant taste, particularly be-
“ fore it comes to its full growth, whence the
“ plant has acquired the name of *Manna-Grass*.
“ Ducks and other water-fowl feed on it with
“ much eagerness: LINNÆUS has remarked,
“ that the water-fowl are very well acquainted
“ with the method of collecting these seeds.
“ It has been observed likewise, that fish are
“ fond of it; and that trout in particular thrive
“ in those rivers where this grass grows in plenty,
“ and sheds its seeds; but it is not only for
“ birds and fish, but also for man, a palatable

“ and nutritious food, and has for many years
 “ past been known at gentlemen’s tables under
 “ the name of *Manna-Grout*.

“ The Manna-Grass is of two kinds ; the one,
 “ *Panicum sanguinale*, or *Cock’s-foot Panic*
 “ *Grass* ; the other, *Festuca fluitans*, which we
 “ have now described. The former is cultiva-
 “ ted in several parts of *Germany*, and its seed
 “ somewhat resembles that of millet ; the latter
 “ is collected in great abundance from the plant
 “ as it grows wild in *Poland*, *Lithuania*, the
 “ *New Marche*, and about *Frankfort*, and other
 “ places in *Silesia*, as also in *Denmark* and
 “ *Sweden*, and hence exported to all parts.

“ The common method they make use of to
 “ gather and prepare this seed in *Poland*,
 “ *Prussia*, and the *Marche*, is as follows. At
 “ sun-rise the seed is gathered or beat from the
 “ dewy grass into a horse-hair sieve, and when
 “ a tolerable quantity is collected, it is spread
 “ on a sheet, and dried fourteen days in the sun ;
 “ it is then thrown into a kind of wooden
 “ trough or mortar, straw or reeds laid between
 “ it, and beat gently with a wooden pestle, so
 “ as to take off the chaff, and then winnowed.
 “ After this it is again put into the mortar, in
 “ rows with dried marygold-flowers, apple, and

"hazel-leaves, and pounded until the husk is
 "entirely separated, and the seed appears
 "bright; it is then winnowed again, and when
 "it is by this last process made perfectly clean,
 "it is fit for use. The marygolds are added
 "with a view to give the seeds a finer colour.
 "The most proper time for collecting them is in
 "July. A bushel of the seed and chaff yields
 "about two quarts of clean seed.

"When boiled with milk or wine they form
 "an extremely palatable food: and are most
 "commonly made use of whole, in the man-
 "ner of *Sago*, to which they are in general pre-
 "ferred."

In the month of October last, I discovered
 in a watery ditch, which runs through a meadow
 not far from Kent-Street-Road, an uncommon
 appearance in some of the seeds of this grass;
 and, on a further examination, I found whole
 panicles, the seeds of which were affected in a
 similar manner; instead of being of their na-
 tural size and colour, they were enlarged to a
 very great degree, assumed externally a blackish
 colour, and were more or less incurvated.
 Struck with the novelty as well as oddity of the
 appearance, I conjectured at first that it was a
 disease occasioned by some insect; I examined

it more attentively, but could not find the least cause to suppose that an insect had been concerned in it. The surface of some of these seeds was rough, and chopped; they were light as to weight, internally of a whitish colour, insipid in their taste, but not disagreeable. Having a little before this been favoured with a sight of some *horned Rye*, it now occurred to me, that this was the same disease which had been said to effect the *Rye* only, and further inquiry confirmed my conjecture.

As this singular disease of the *Rye* has first been noticed by the French, and as some very uncommon circumstances have attended it, it cannot fail of proving acceptable to our readers to lay before them the substance of what they have said concerning it. In the *Histoire de L'Academie Royale des Sciences* there is an account given of a particular species of gangrene or mortification which attacked many persons in some particular provinces of *France*. "It began generally at the toes, and sometimes spread as high as the thigh. Out of fifty people there was but one that was attacked with this disease in the hands; and what was equally remarkable, there were no females affected with it, except some little girls.

" It appears that this singular malady at-
 " tacked only the lower sort of people, and that
 " too in years of scarcity ; that it proceeded from
 " bad nourishment, and principally from eating
 " bread made of a certain black and diseased
 " corn called *Ergot*, from the grains assuming
 " somewhat of the form of a Cock's Spur.
 " *Vid. fig. 12.*

" The manner in which this singular mon-
 " strosity of the corn is produced, is thus re-
 " lated by Monsieur FAGON.

" There are certain mists which prove in-
 " jurious to the corn, and from which the
 " greatest part of the ears of the Rye defend
 " themselves by their beards. In those, how-
 " ever, which this hurtful humidity can strike
 " and penetrate, it rots, the skin which covers
 " the grain, blackens it, and alters the substance
 " of the grain itself, the juices which form the
 " seed, being no longer kept within their ordi-
 " nary bounds by the skin, are carried hither
 " in too great an abundance, and amassing
 " themselves irregularly form this monstrous
 " appearance.

" He observes, that it is *only in Rye* that the
 " *Ergot* is to be found ; that the poor people
 " do not separate this grain from that which is

“ good ; that it was only in such particular
 “ seasons as favoured the growth of the *Ergot*
 “ that this disease was prevalent ; that the
 “ country people, after eating bread made of
 “ this bad corn, perceived themselves as if
 “ drunk, and after this the mortification general-
 “ ly took place ; that in some provinces, where
 “ there was but little of this *Ergot*, this species
 “ of disease was not known.

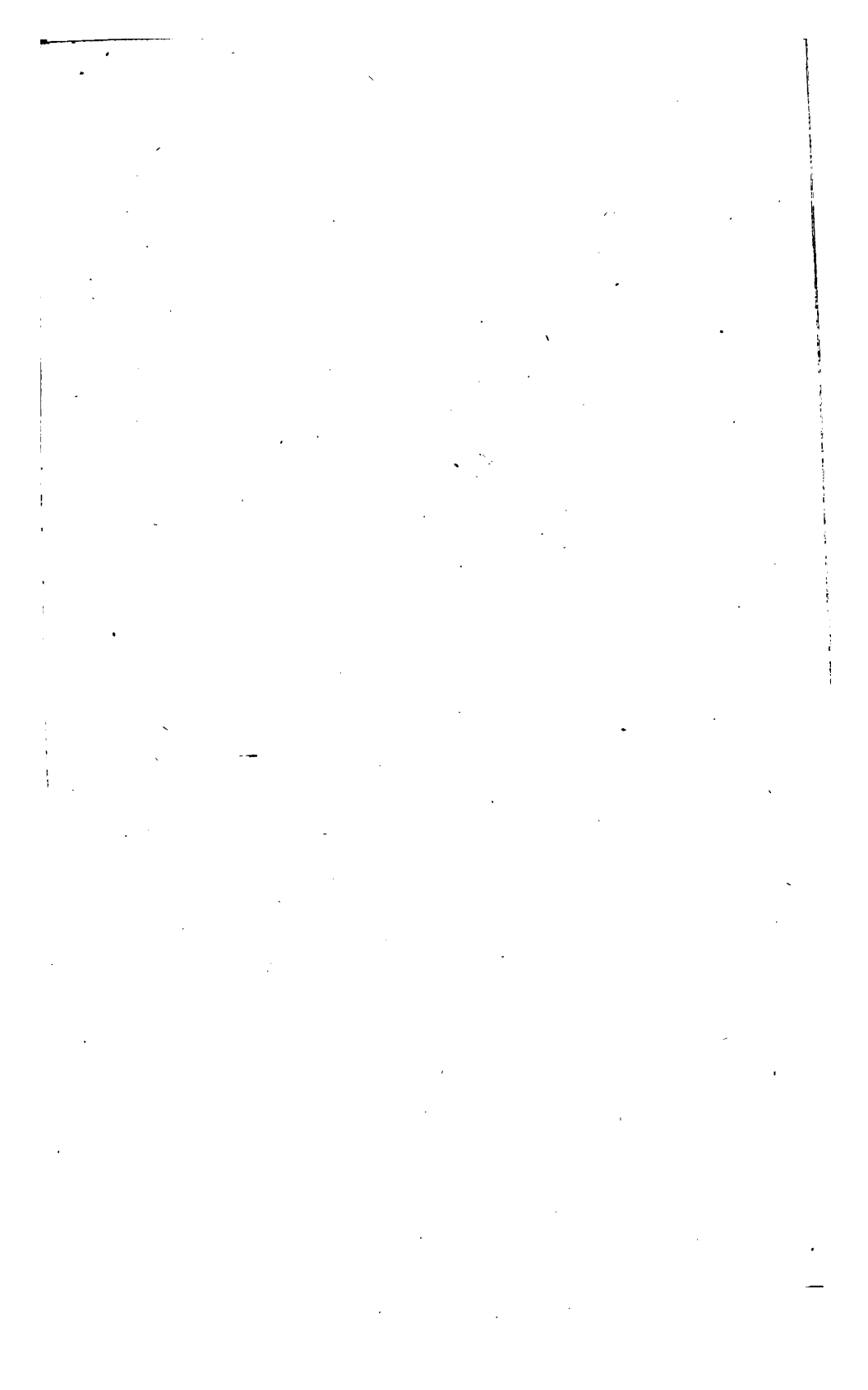
“ From the observations made by the farmers
 “ of that country it appears, that this bad species
 “ of grain is produced in the greatest abundance
 “ in such land as is wet and cold, and particu-
 “ larly in rainy seasons. The poultry refused
 “ it when given them ; nevertheless, if by acci-
 “ dent they had eaten it, they did not appear
 “ to be hurt by it. When sown (as might be
 “ expected) it did not vegetate.”

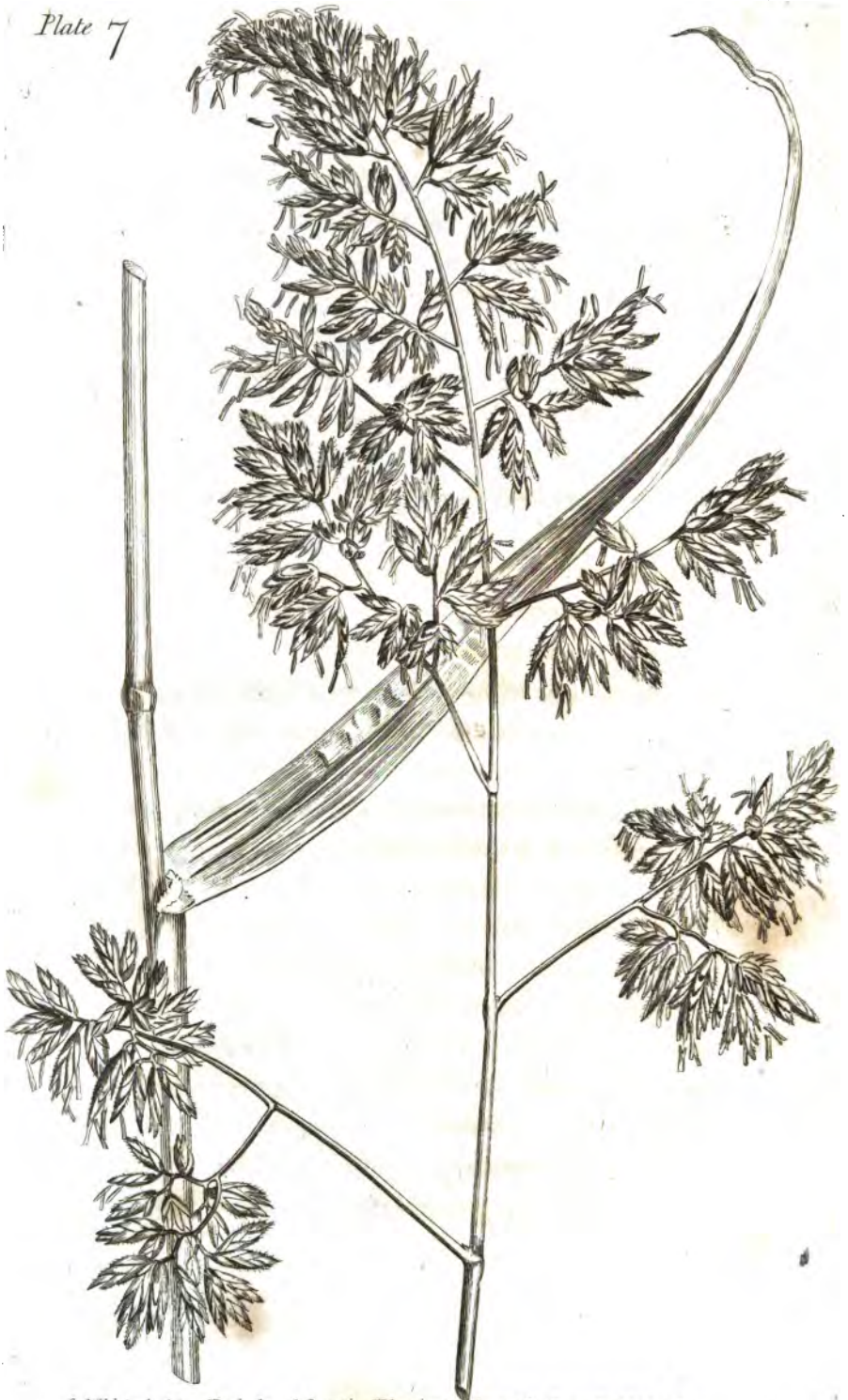
A kind of mortification, very similar to the
 above described, was observed in this kingdom
 some years ago ; it affected the same kind of
 people, and on inquiry it was found that they
 had fared very hard ; and that the bread which
 they had eaten was made of the *tailings* or *screen-*
ings of corn ; but it was not ascertained whether
 it contained any of the *Ergot* or not.

From the insipid taste of this corn, as well as from its not proving fatal to poultry, it seems exceedingly probable that is not in itself noxious, any otherwise than as it affords no nourishment; and that those people who have eaten of this corn, have in fact been abridged of a proportionate quantity of food; hence, from an impoverished state of the fluids, and a weak action of the vessels, this species of mortification might easily be induced.

REMARKS.

Since Mr. CURTIS's time, it seems to have been generally decided to consider the *fluitans* or *flote-grass*, as appertaining to the genus *Poa*. The *poa fluitans*, or *flote poa grass*, however nutritious or useful it might prove as cattle food, has been found so perfectly aquatic as to be unsusceptible of naturalization and culture upon any soil, even upon bog, where on the approach of drought the grass would perish. The black and diseased corn called *Ergot*, from the grains assuming something of the form of a cock's spur, was in all probability so affected by atmospheric blight, bearing analogy with the *ear-cockle*, or distorted grains of wheat.





Dactylis glomeratus, *Rough Cock's-foot*,
 p. 23. Mr. CURTIS represents this as a coarse, hardy, early, and productive grass, but has not included it in the superior species. It has been heretofore generally decried for its coarseness, its presumed want of nutritive properties, and the neglect of cattle. Similar opinions still prevail among certain of our ablest and most intelligent cultivators, on the plea that all the ends proposed by the culture of this grass, may be obtained from others of our numerous and well known superior species.

On the other hand, the *rough cock's-foot* has, of late years, become a favourite object of culture, as a separate grass, with some eminent and extensive farmers, on account of its certainty of growth, early use, abundant quantity, and accommodation of itself to almost all sorts of soils. It is necessary, as with all coarse grasses, to feed or cut early, and most particularly on rich and moist soils; with which precaution, the *cock's-foot*, being young, tender and juicy, is said not only to be very nutritious, but well affected by all sorts of cattle. Its second product is to be depended upon for quantity.

ROGERS PARKER, Esq. of Munden, Herts,
 a gentleman of great intelligence on these sub-

jects, is supposed to have taken the lead, some ten or twelve years since, in the culture of *cock's-foot*, from seed purchased of Mr. GIBBS, seedsman to the Board of Agriculture, who had then collected a considerable quantity in bulk. Mr. Parker mixed a small quantity of *curled dog's-tail* with the *cock's-foot*, which produced extraordinary crops*.

T. W. COKE, Esq. of Holkham, continues to grow great quantities of the *cock's-foot* grass, and takes every opportunity of recommending it in the strongest and most unreserved terms.

* An improved perennial *Ray-Grass* has been produced of late years, which is said to vegetate earlier, and seed later than the old *ray*; also to produce luxuriantly and preserve its verdure in the dog-days; the seed is sold at GIBBS's in London.

The Editor embraces this opportunity of returning his very cordial thanks to Mr. GIBBS for his readiness to communicate information on all occasions, and for the free access allowed to his nursery at Brompton, where may be seen the most extensive and best collection of natural and artificial grasses at this time in England; a pursuit in which Mr. Gibbs, faithfully answering the intentions of the Board of Agriculture, has been indefatigable for a number of years.

Buzias Orientalis, a broad leaved foreign grass of great bulk and nutritious qualities formerly recommended by Mr. YOUNG, is cultivated by Mr. GIBBS at Brompton, and at present under experiment by various stockfeeders.

Agrostis Stolomifera. *Creeping bent grass.*
Red Robin (Suffolk.) *Surface Couch*, or *Quitch*,
 known by various other provincial appellations
 in England, and held to be a troublesome weed,
 on certain descriptions of arable soils. In Ire-
 land, denominated *fiorin*, or *butter grass*. Bears
 affinity to the *doub*, a grass of high repute in
 India.

Dr. Richardson has, of late years, in Ireland,
 discovered great and valuable properties in the
fiorin grass, and upon his authority, the follow-
 ing account of it rests.

DESCRIPTION and HABITS.—Long strings
 with lively green sprouts issuing from them, at right
 angles, at a few inches distant from each other;
 the strings vary in length, from one to ten feet;
 in summer, always green; sometimes part of
 them have a dull blood-red shade, whence pro-
 bably the grass got the name of *red-robin*. Most
 of the strings whiten in winter, when not covered
 up by their own mat, or by water, when they
 preserve their green colour: the whiteness is
 confined to the envelope; peel that off, and the
 small interior tube is always found to be of a
 lively green.

Fiorin has scarcely any root, the slightest
 catch of the earth is sufficient for its existence

and nourishment, is indifferent to the extremes of wet and drought, most luxuriant in the former; indifferent as to high or low grounds, insensible to cold, and of great value under Indian heats; can bear great privations of air and sun; its roots to be found under privations which no other grass can bear, scarcity of soil, loss of the sun's rays and want of free circulation of air; situations, where these prevail, to be searched for *fiorin* strings, by the planter; such as sides of commons, beaten gravel roads, in shallow hungry soils, the north sides of all walls, where the green sod comes close up to the wall; and at the contact of the sod and the wall; *fiorin* is nearly the only grass, in church-yards protected from cattle, north wall: to find it, thrust down the fingers between the green sod and the wall, and claw up whatever grassy substance is found, which will generally be *fiorin*. So found by Mr. DICKINSON, M. P. for Somerset, in that county. Thrives in plantations under the trees, which should be stocked with it, no other grass being fit for such a shaded situation—the practice general in Ireland. Does not injure young plantations by rising high like other grasses, but lies flat on the ground. *Fiorin* hay composed exclusively of the strings, essentially different from all other hay,

which is composed of leaves and stalks, dead matter ; hence *fiorin* hay retains life during many months, and will vegetate, which adapts it to preservation, or hay-making in the winter season. To be found on the summits of the highest mountains in Ireland, and will grow on the top of a garden wall, merits trial on barren sands.

Not an aquatic, but amphibious. In very wet places, generally mixed with the *festuca fluitans* (manna grass,) and the *aria aquatica*, (water hair grass,) both so strongly resembling it, that they would sometimes mislead, and both so decidedly aquatic, that drought is fatal to each of them. The situations we are led to by its amphibious nature, are such as are exposed to the alternations of wet and drought, the bottom of ditches wet in winter and dry in summer, winter drains, irrigator's conduits, &c. will afford an inexhaustible stock of roots and strings. In a late letter to the Farmer's Magazine, Dr. RICHARDSON assumes, that nature is determined and actually *attempting* to clothe every acre with *fiorin* ; and that she would succeed, were it not for the sturdier rivals of quicker growth that interfere.

CULTURE.—*Fiorin* is never raised from the seeds, which are small, light, and slow of growth,

and apt to be choked and overpowered by the stronger grasses and weeds. It is planted by laying down the strings. These strings laid on a raw surface, especially if rich, any time from the 10th of September to the 1st of April, and lightly sprinkled with earth or compost, so as nearly to cover them, will surely vegetate and clothe the surface. Between April and September, the growth of weeds is more rapid than that of *forin*, and will require much attention to secure their extirpation; in this period too, other grasses will rise and embarrass. Every other grass to be weeded out. The first or second week in October, the proper season for mowing *fiorin*. Irrigation profitable.

QUANTITY per acre.—Quantity from five to ten tons of dry and well cured hay. Dr. RICHARDSON warrants the *forin* grass and hay to be superior to all other species, and that animals prefer it to all other. His quantity per acre in 1808, was above 16,000 lbs. or 8 tons; in 1810, above 18,000 lbs. or 9 tons of choice hay to the English acre. He remarks somewhere, that the hay when weighed was rattling dry.

Fiorin grass has been cultivated in Scotland, by Mr. MILLAR of Dalswinton, and in the vicinity of Edinburgh, during several seasons past,

and, as far as the results have yet transpired, with a promising degree of success. Also by Dr. PRING in Wales.

In England, Lord Rous is a principal cultivator of the *fiorin* grass and the editor begs leave to return his public and most respectful acknowledgements to the noble Lord, for his polite attention and ready communication of the following particulars in a letter dated January 17th from Henham Hall, on the coast of Suffolk. His Lordship has three acres of good established *fiorin*, in its second season, planted in rows a foot apart, from strings purposely collected: only about half an acre of it has yet been cut, for the use of planters. Eleven acres more were strewed over with *fiorin* in October and November last, according to the method recommended by Mr. Farish, in his pamphlet, of the success of which, Lord Rous expresses himself somewhat doubtfully, but observes that a good deal of it has taken root at the joints.

As far as Lord Rous's experiments have proceeded hitherto, he is ready to confirm Dr. RICHARDSON's good opinion of this grass. It has been eaten greedily by every animal to which it was offered, and his lordship's blood mares and racing colts will follow him in the pad-

docks for a mouthful of *florin*, for which they will reject both the best pasture they may be upon and the best hay. It is however for cows and sheep, from October to April, that Lord Rous looks to the *florin* grass for its principal use, and recommends it to be cut green, a waggon load at a time, like lucerne or tares, and given to them dried in the air, without the expence of its being regularly made into hay. His Lordship expects to be able in the course of the next winter, to give a more ample and decisive account.

The Earl of HARDWICKE, president of the Cambridgeshire Agricultural Society, has lately offered premiums for the culture of *florin* grass. In the advertisement of the Society, it is stated, that *florin* produces an immense crop of green winter food for milch cows, cattle, sheep and young horses; that for working horses, it is better to make it into hay, in the winter, as it dries easily, and is not injured by the weather, nor heats in the cock; that it produces from six to eight tons per acre; planted in autumn, it will be fit to cut the following Christmas; may be gathered for planting from the sides of roads and ditches. It is not explained, whether these accounts refer to Ireland, or that such degree of

success with this grass, has been actually experienced in England.

On the other hand, late accounts from the West of England are said not to be favourable to the culture of this grass. The Editor's own experiments upon a small scale, have not turned out successful. A sample of well made *fiorin* hay was universally condemned, with one exception, by the dealers and consumers in London, to whom it was shewn. Neither cows nor horses shewed any predilection for the hay or the grass itself; some rejected the hay. Fresh strings from a two year old plantation originally from Ireland, planted in September last, in foot rows, upon a tilth of perfect cleanness, produced only twenty or thirty blades of *fiorin* to the yard square, which have since declined. The above two year old plantation, although of a perfectly healthy and luxuriant appearance, has never exhibited any sign of that vast quantity, which, from the experience in Ireland, we have been taught to expect; probably not of so great a bulk, as we might reasonably have looked for, in the same time, from other grasses. Nor does nature seem to evince the same determination, in this country, as Dr. RICHARDSON supposes her to have done in Ireland; for al-

though natural *fiorin* is indubitably to be found in most parts of England, it is by no means universal or superabundant. Neither is the partiality in animals for *fiorin*, green or dry, so conspicuous here, as it is found to be in the sister island. Upon Lord SOMERVILLE's Cobham estate, Fair-mile, the cattle and sheep have been invariably observed to pass over the patches of natural *fiorin* grass, leaving it untouched. As far as it may be allowable to judge from very slender experience, *fiorin* grass appears to the present writer, comparatively light and innutritious; but he is still inclined to adhere to his former opinion, that from its winter habits, it may have its use as cutting grass for that season and early spring, subject however to a comparison, for quantity and quality, with our usual kept grasses. Such comparison, probably, might not be unprofitable even in Ireland, the heat of present enthusiasm being a little moderated. It was surely a most unfortunate judgment, which identified *fiorin* with couch; they are grasses of different *genera* and indicative appearance. Couch produces a spike like rye, *fiorin* branches; the roots are totally dissimilar. Nor is the celebrated *Orcheston*, Wiltshire grass, an *agrostis*, or *fiorin*, but the bulk of it of the genus *poa*.

A
SHORT ACCOUNT
OF
THE CAUSE
OF
THE DISEASE IN CORN,
CALLED BY FARMERS
THE
BLIGHT, THE MILDEW, AND THE RUST.

BY SIR JOSEPH BANKS, BART.

WITH A PLATE

THE following brief Publication, suggested by the alarming state of the Harvest in August last, would have been distributed before the end of wheat seed-time, had the Engraver fulfilled his engagement.

This circumstance will, it is hoped, be considered as a sufficient apology for the want of actual observations on the origin and progress of the disease. These it is presumed will be abundantly supplied, in the course of the present year, by those intelligent Agriculturists whose residence in the country enables them daily to examine, not only the progress of their crops, but the origin and advances also of all those obstacles which nature has opposed to the success of agricultural labours, as if to awaken the energies of reason, and to reward the farmer for the exertions of his intellectual faculties, by the satisfaction of surmounting them.

Jan. 30th. 1805.

ON

THE BLIGHT IN CORN.

BOTANISTS have long known that the blight in corn is occasioned by the growth of a minute parasitic fungus or mushroom on the leaves, stems, and glumes of the living plant. Felice Fontana published in the year 1767, an elaborate account of this mischievous weed *, with microscopic figures, which give a tolerable idea of its form; more modern botanists † have given figures both of corn and of grass affected by it, but have not used high magnifying powers in their researches.

Agriculturists do not appear to have paid, on this head, sufficient attention to the discoveries

* Osservazioni sopra la Ruggine del Grano. Lucca, 1767, 8vo.

† Sowerby's English Fungi, Vol. II. Tab. 140. Wheat, Tab. 139. *Poa aquatica*.

of their fellow-labourers in the field of nature ; for though scarce any English writer of note on the subject of rural economy has failed to state this opinion of the origin of this evil, no one of them has yet attributed it to the real cause, unless Mr. Kirby's excellent papers on some diseases of corn, published in the Transactions of the Linnean Society, are considered as agricultural essays,

On this account it has been deemed expedient to offer to the consideration of farmers, engravings of this destructive plant, made from the drawings of the accurate and ingenious Mr. Bauer, Botanical Painter to his Majesty, accompanied with his explanation, from whence it is presumed an attentive reader will be able to form a correct idea of the facts intended to be represented, and a just opinion whether or not they are, as is presumed to be the case, correct and satisfactory.

In order, however, to render Mr. Bauer's explanation more easy to be understood, it is necessary to premise, that the striped appearance of the surface of a straw which may be seen with a common magnifying glass, is caused by alternate longitudinal partitions of the bark, the one imperforate, and the other furnished with

one or two rows of pores or mouths, shut in dry, open in wet weather, and well calculated to imbibe fluid whenever the straw is damp*.

By these pores, which exist also on the leaves and glumes, it is presumed that the seeds of the fungus gain admission, and at the bottom of the hollows to which they lead (See Plate, fig. 1, 2), they germinate and push their minute roots, no doubt (though these have not yet been traced), into the cellular texture beyond the bark, where they draw their nourishment, by intercepting the sap that was intended by nature for the nutriment of the grain; the corn of course becomes shrivelled in proportion as the fungi are more or less numerous on the plant; and as the kernel

* Pores or mouths similar to these are placed by nature on the surface of the leaves, branches, and stems, of all perfect plants; a provision intended no doubt to compensate, in some measure, the want of locomotion in vegetables. A plant cannot when thirsty go to the brook, and drink; but it can open innumerable orifices for the reception of every degree of moisture, which either falls in the shape of rain and of dew, or is separated from the mass of water always held in solution by the atmosphere: it seldom happens, in the driest season, that the night does not afford some refreshment of this kind, to restore the moisture that has been exhausted by the heats of the preceding day.

only is abstracted from the grain, while the cortical part remains undiminished, the proportion of *flour to bran* in blighted corn is always reduced in the same degree as the corn is made light. Some corn of this year's crop will not yield a stone of flour from a sack of wheat; and it is not impossible that in some cases the corn has been so completely robbed of its flour by the fungus, that if the proprietor should choose to incur the expense of thrashing and grinding it, bran would be the produce, with scarce an atom of flour for each grain.

Every species of corn, properly so called, is subject to the blight; but it is observable that spring corn is less damaged by it than winter, and rye less than wheat, probably because it is ripe, and cut down before the fungus has had time to increase in any large degree.—Tull, says that “white cone or bearded wheat, which hath “its straw like a rush full of pith, is less subject “to blight than Lammas wheat, which ripens “a week later.” See page 74. The spring wheat of Lincolnshire was not in the least shrivelled this year, though the straw was in some degree infected: the millers allowed that it was the best sample brought to market. Barley was in some places considerably spotted;

but as the whole of the stem of that grain is naturally enveloped in the hose or the basis of the leaf, the fungus can in no case gain admittance to the straw : it is however to be observed, that barley rises from the flail lighter this year than was expected from the appearance of the crop when gathered in.

Though diligent enquiry was made during the last autumn, no information of importance relative to the origin or the progress of the blight could be obtained : this is not to be wondered at; for as no one of the persons applied to had any knowledge of the real cause of the malady, none of them could direct their curiosity in a proper channel. Now that its nature and cause have been explained, we may reasonably expect that a few years will produce an interesting collection of facts and observations, and we may hope that some progress will be made towards the very desirable attainment of either a preventive or a cure.

It seems probable that the leaf is first infected in the spring, or early in the summer, before the corn shoots up into straw, and that the fungus is then of an orange colour *; after the straw has

* The Abbé Tessier, in his *Traité des Maladies des Grains*, tells us, that in France this disease first shows itself

become yellow, the fungus assumes a deep chocolate brown : each individual is so small, that every pore on a straw will produce from 20 to 40 fungi, as may be seen in the plate, and every one of these will no doubt produce at least 100 seeds : if, then, one of these seeds tillows out into the number of plants that appear at the bottom of a pore in the plate, fig. 7, 8, how incalculably large must the increase be ! A few diseased plants scattered over a field must very speedily infect a whole neighbourhood, for the seeds of fungi are not much heavier than air, as every one who has trod upon a ripe puff-ball must have observed, by seeing the dust, among which is its seed, rise up and float on before him.

How long it is before this fungus arrives at puberty, and scatters its seeds in the wind, can only be guessed at by the analogy of others ; probably the period of a generation is short, possibly not more than a week in a hot season : if so, how frequently in the latter end of the

in minute spots of a dirty colour on the leaves and stems, which spots extend themselves by degrees, and in time change to a yellow colour, and throw off a dry orange coloured powder. Pp. 201, 340,

summer, must the air be loaded, as it were, with this animated dust, ready whenever a gentle breeze, accompanied with humidity, shall give the signal to intrude itself into the pores of thousands of acres of corn ! Providence, however, careful of the creatures it has created, has benevolently provided against the too extensive multiplication of any species of being : was it otherwise, the minute plants and animals, enemies against which man has the fewest means of defence, would increase to an inordinate extent ; this, however, can in no case happen, unless many predisposing causes afford their combined assistance. But for this wise and beneficent provision, the plague of slugs, the plague of grubs, wire-worms, chafers, and many other creatures whose power of multiplying is countless as the sands of the sea, would, long before this time, have driven mankind, and all the larger animals, from the face of the earth.

Though all old persons who have concerned themselves in Agriculture remember the blight in corn many years, yet some have supposed that of late years it has materially increased ; this, however, does not seem to be the case. Tull, in his horse-hoeing husbandry, p. 74, tells us, that the year 1725, " was a year of blight, the like of

“ which was never before heard of, and which
 “ he hopes may never happen again ;” yet the
 average price of wheat in the year 1726, when
 the harvest of 1725 was at market, was only
 36s. 4d. and the average of the five years of
 which it makes the first, 37s. 7d.—1797 was also
 a year of great Blight: the price of wheat in
 1798 was 49s. 1d. and the average of the five
 years, from 1795 to 1799, 63s. 5d*.

The climate of the British isles is not the only
 one that is liable to the Blight in corn ; it hap-
 pens occasionally in every part of Europe, and
 probably in all countries where corn is grown.
 Italy is very subject to it, and the last harvest

* The scarcity of the year 1801 was in part occasioned
 by a mildew, which in many places attacked the plants of
 wheat on the S. E. side only, but was principally owing to
 the very wet harvest of 1800 ; the deficiency of wheat at
 that harvest was found, on a very accurate calculation,
 somewhat to exceed $\frac{1}{4}$ th : but wheat was not the only grain
 that failed ; all others, and potatoes also, were materially
 deficient. This year the wheat is probably somewhat more
 damaged than it was in 1800, and barley somewhat less than
 an average crop : every other article of agricultural food is
 abundant, and potatoes one of the largest crops that has
 been known ; but for these blessings on the labour of man,
 wheat must before this time have reached an exorbitant
 price.

of Sicily has been materially hurt by it. Specimens received from the colony of New South Wales shew that considerable mischief was done to the wheat crop there in the year 1803 by a parasitic plant, very similar to the English one.

It has long been admitted by farmers, though scarcely credited by botanists, that wheat in the neighbourhood of a Barberry bush seldom escapes the Blight. The Village of Rollesby in Norfolk, where barberries abound, and wheat seldom succeeds, is called by the opprobrious appellation of Mildew Rollesby. Some observing men have of late attributed this very perplexing effect to the farina of the flowers of the barberry, which is in truth yellow, and resembles in some degree the appearance of the rust, or what is presumed to be the Blight in its early state.

It is, however, notorious to all botanical observers, that the leaves of the barberry are very subject to the attack of a yellow parasitic fungus, larger, but otherwise much resembling the rust in corn.

Is it not more than possible that the parasitic fungus of the barberry and that of wheat are one and the same species, and that the seed is transferred from the barberry to the corn? Mistletoe,

the parasitic plant with which we are the best acquainted, delights most to grow on the apple and hawthorn, but it flourishes occasionally on trees widely differing in their nature from both of these ; in the Home Park, at Windsor, misle-toe may be seen in abundance on the lime trees planted there in avenues. If this conjecture is founded, another year will not pass without its being confirmed by the observations of inquisitive and observing farmers.

It would be presumptuous to offer any remedy for a malady, the progress of which is so little understood ; conjectures, however, founded on the origin here assigned to it, may be hazarded without offence.

It is believed * to begin early in the spring, and first to appear on the leaves of wheat in the form of rust, or orange-coloured powder : at this season, the fungus will, in all probability, require as many weeks for its progress from infancy to puberty as it does days during the heats of autumn ; but a very few plants of wheat, thus infected, are quite sufficient, if the fungus

* This, though believed, is not dogmatically asserted, because FONTANA, the best writer on the subject, asserts that the yellow and the dark-coloured Blight, are different species of fungi.

is permitted to ripen its seed, to spread the malady over the field, or indeed over a whole parish.

The chocolate-coloured Blight is little observed till the corn is approaching very nearly to ripeness; it appears then in the field in spots, which increase very rapidly in size, and are in calm weather somewhat circular, as if the disease took its origin from a central position.

May it not happen, then, that the fungus is brought into the field in a few stalks of infected straw uncorrupted among the mass of dung laid in the ground at the time of sowing? it must be confessed, however, from the clover lays, on which no dung from the yard was used, were as much infected last autumn as the manured crops. The immense multiplication of the disease in the last season seems however to account for this, as the air was no doubt frequently charged with seed for miles together, and deposited it indiscriminately on all sorts of crops.

It cannot, however, be an expensive precaution to search diligently in the spring for your plants of wheat infected with the disease, and carefully to extirpate them, as well as all grasses, for several are subject to this or a similar

malady, which have the appearance of orange-coloured or of black stripes on their leaves, or on their straw; and if experience shall prove that uncorrupted straw can carry the disease with it into the field, it will cost the farmer but little precaution to prevent any mixture of fresh straw from being carried out with his rotten dung to the wheat field.

In a year like the present, that offers so fair an opportunity, it will be useful to observe attentively whether cattle in the straw-yard thrive better or worse on blighted than on healthy straw. That blighted straw, retaining on it the fungi that have robbed the corn of its flour, has in it more nutritious matter than clean straw which has yielded a crop of plump grain, cannot be doubted; the question is, whether this nutriment in the form of fungi does, or can be made to agree, as well with the stomachs of the animals that consume it, as it would do in that of straw and corn.

It cannot be improper in this place to remark, that although the seeds of wheat are rendered, by the exhausting power of the fungus, so lean and shrivelled that scarce any flower fit for the manufacture of bread can be obtained by grinding them, these very seeds will, except, perhaps,

in the very worst cases*, answer the purpose of seed corn as well as the fairest and plumpest sample that can be obtained, and in some respects better; for a bushel of much blighted corn will contain one-third at least more grains in number than a bushel of plump corn, three bushels of such corn will go as far in sowing land, as four bushels of large grain.

The use of the flour of corn in furthering the process of vegetation is to nourish the minute plant from the time of its developement till its roots are able to attract food from the manured earth; for this purpose one-tenth of the contents of a grain of good wheat is more than sufficient. The quantity of flour in wheat has been increased by culture and management, calculated to improve its qualities for the benefit of mankind, in the same proportion as the pulp of apples and pears has been increased, by the same means, above what is found on the wildings and crabs in the hedges.

It is customary to set aside or to purchase for seed corn the boldest and plumpest samples that

* 80 grains of the most blighted wheat of the last year, that could be obtained, were sown in pots in the hot-house; of these, seventy-two produced healthy plants, a loss of 10 per cent only.

can be obtained; that is, those that contain the most flour; but this is unnecessary waste of human subsistence: the smallest grains, such as are sifted out before the wheat is carried to market, and either consumed in the farmer's family, or given to his poultry, will be found by experience to answer the purpose of propagating the sort from whence they sprung, as effectually as the largest.

Every ear of wheat is composed of a number of cups placed alternately on each side of the straw; the lower ones contain, according to circumstances, three or four grains, nearly equal in size; but towards the top of the ear, where the quantity of nutriment is diminished by the more ample supply of those cups that are nearer the root, the third or fourth grain in a cup is frequently defrauded of its proportion, and becomes shrivelled and small. These small grains, which are rejected by the miller, because they do not contain flour enough for his purpose, have nevertheless an ample abundance for all purposes of vegetation, and as fully partake of the sap (or blood, as we should call it in animals) of the kind which produced them, as the fairest and fullest grain that can be obtained from the bottoms of the lower cups by the wasteful process of beating the sheaves.

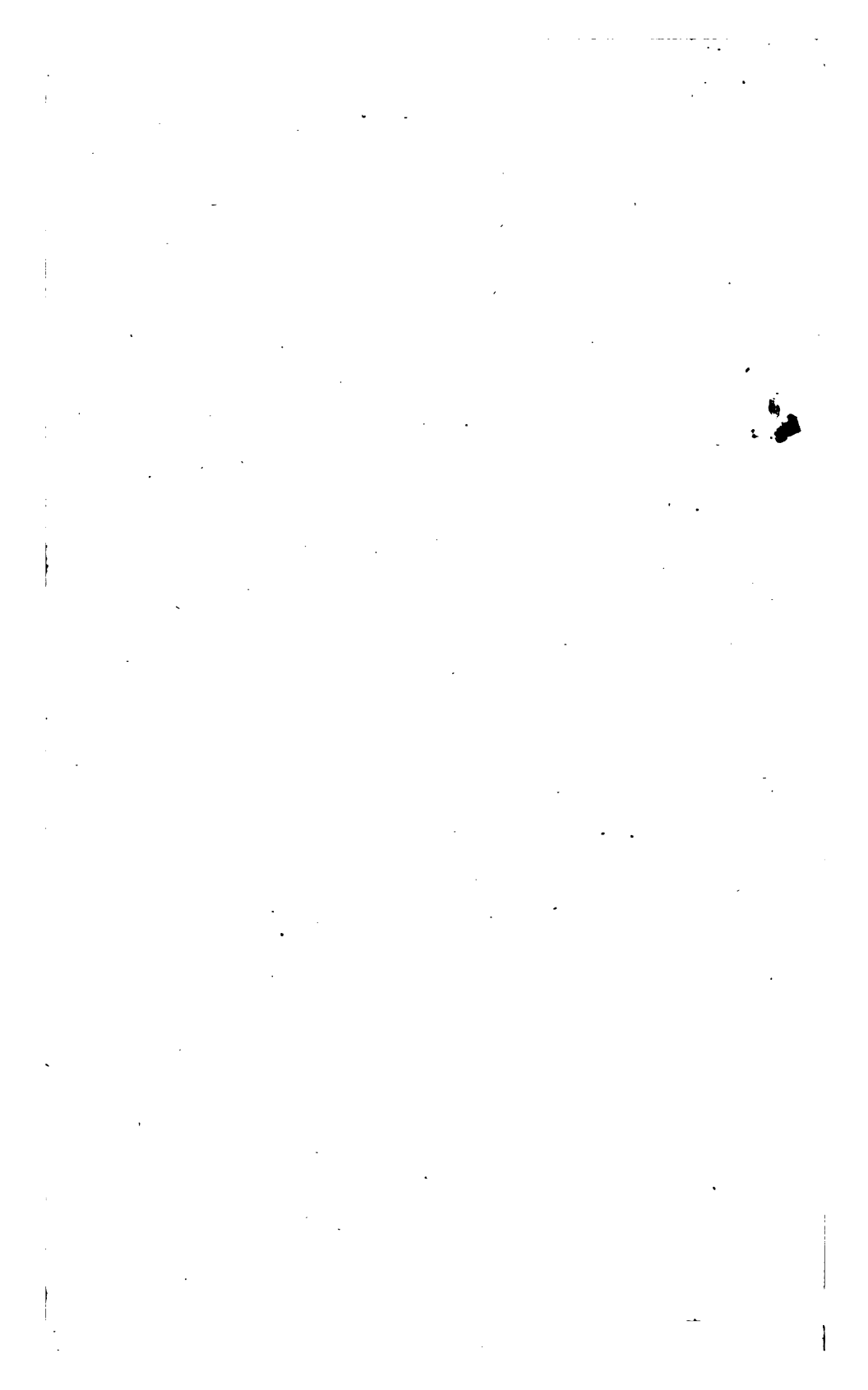


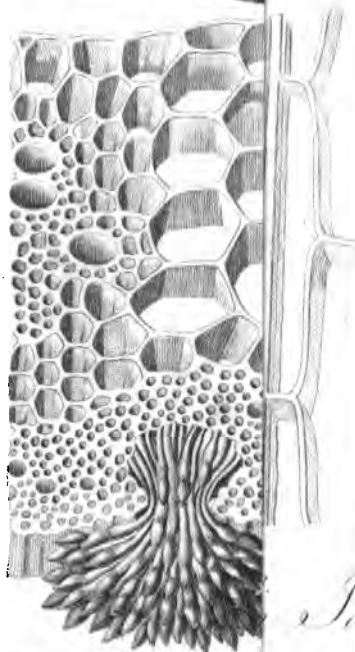
Fig. 1.



b.

c.

Fig. 3.



OD.



EXPLANATION OF THE PLATE.

1. A piece of the infected wheat straw—natural size: at *a* the Wheat-sheath is broken and removed, to shew the straw which is not infected under it.
2. A highly magnified representation of the parasitic plant which infects the wheat: *a* in a young state; *b* full grown; *c* are two plants bursting and shedding their seeds when under water in the microscope; *d* two plants burst in a dry place; *e* seems to be abortive; *f* seeds in a dry state; *g* a small part of the bottom of a pore with some of the parasitic fungi growing upon it.
3. A part of the straw of fig. 1, magnified.
4. Part of fig. 3, at *a b* more magnified.
5. Part of a straw similar to fig. 3, but in its green state, and before the parasitic plant is quite ripe.
6. A small part of the same, more magnified.
7. A highly magnified transverse cutting of the straw, corresponding with fig. 4, shewing the insertion of the parasite in the bark of the straw.

8. A longitudinal cutting of the same, magnified to the same degree.
9. A small piece of the epidermis of a straw, shewing the large pores which receive the seed of the parasite; the smaller spots, observable on the epidermis, are the bases of hairs that grow on the plant of the wheat whilst young, but which fall off when it ripens, magnified to the same degree as the preceding figures.

FINES.

